

MODEL ATMOSPHERES FOR G, F, A, B, AND O STARS

ROBERT L. KURUCZ*

Harvard-Smithsonian Center for Astrophysics
 Received 1978 July 24; accepted 1978 October 11

ABSTRACT

A grid of LTE model atmospheres is presented for effective temperatures ranging from 5500 to 50,000 K, for gravities from the main sequence down to the radiation pressure limit, for abundances solar, 1/10 solar, and 1/100 solar. The models were computed by use of a statistical distribution-function representation of the opacity of almost 10^6 atomic lines. For each model we tabulate the temperature structure, fluxes, *UBV* and *wby* colors, bolometric correction, and Balmer line profiles. The solar abundance models are compared to narrow, intermediate (by Relyea and Kurucz), and wide (by Relyea and Kurucz and by Buser and Kurucz) band photometry and are found to be in good agreement with the observations for effective temperatures above 8000 K. Excellent agreement exists with the spectrophotometry and Balmer line profiles of Vega. A small systematic error in the colors of late A and F stars is probably due to an overestimate of convection in weakly convective models. This error does not seem to affect greatly the use of the predicted colors for differential studies. The solar model has approximately a 2% error in the *V* flux because molecular lines were not included.

Subject headings: spectrophotometry — stars: atmospheres — stars: early-type — Sun: atmosphere

I. INTRODUCTION

Several areas in model atmosphere research require intensive effort at the present time. Among these are the inclusion of realistic opacities, especially line opacity, the treatment of gas-radiation equilibrium (non-LTE), and the treatment of convection. We are not able to treat convection rigorously, but for many stars the overall energy distribution and spectrum are not greatly affected by the dimensional formulation and arbitrary constants of the mixing-length theory now in use. Non-LTE is extremely important for very hot stars and for low-gravity stars even at low temperatures, but models for many stars do not require detailed equilibrium calculations except for the cores of strong lines. Opacities play a role in any model calculation, and for many stars the inclusion of realistic opacities is the major requirement for computing realistic models. Incorrect opacities lead to models that produce errors in the determination of all four parameters—effective temperature, gravity, abundance, and microturbulence.

The first few figures illustrate qualitatively the effects of opacity changes. Figure 1 shows the change in the temperature structure of a model as the ultraviolet opacity is increased. The increased opacity makes it more difficult for the model to radiate, so the model adjusts by increasing the temperature in optically thick layers to maintain constant energy flow. As the atmosphere becomes optically thin in the regions of increased opacity, it becomes too easy for

the model to radiate, so the model adjusts by lowering the temperature in the surface layers. The energy distribution and line profiles are affected considerably because they are determined by the temperature gradient. Figure 2 shows the resulting increase in the

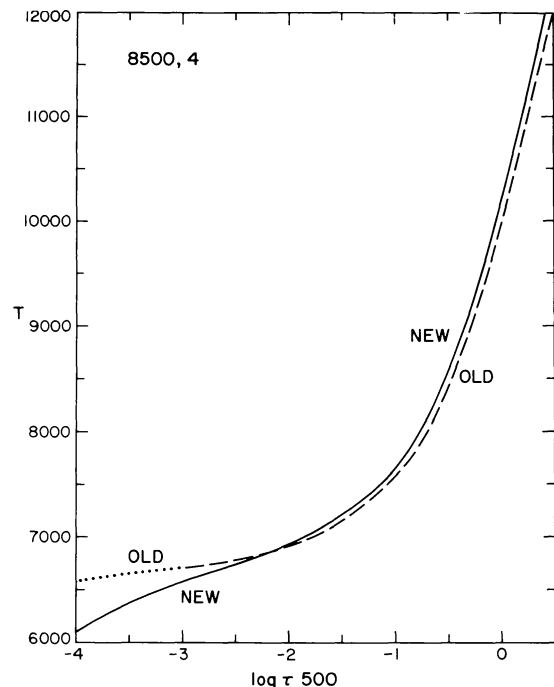


FIG. 1.—The effect of the T - τ relation of increasing the line opacity for an 8500, 4 model. The model labeled "new" has more opacity.

* Visiting Astronomer, Kitt Peak National Observatory, which is operated by the Association of Universities for Research in Astronomy, Inc., under contract with the National Science Foundation.

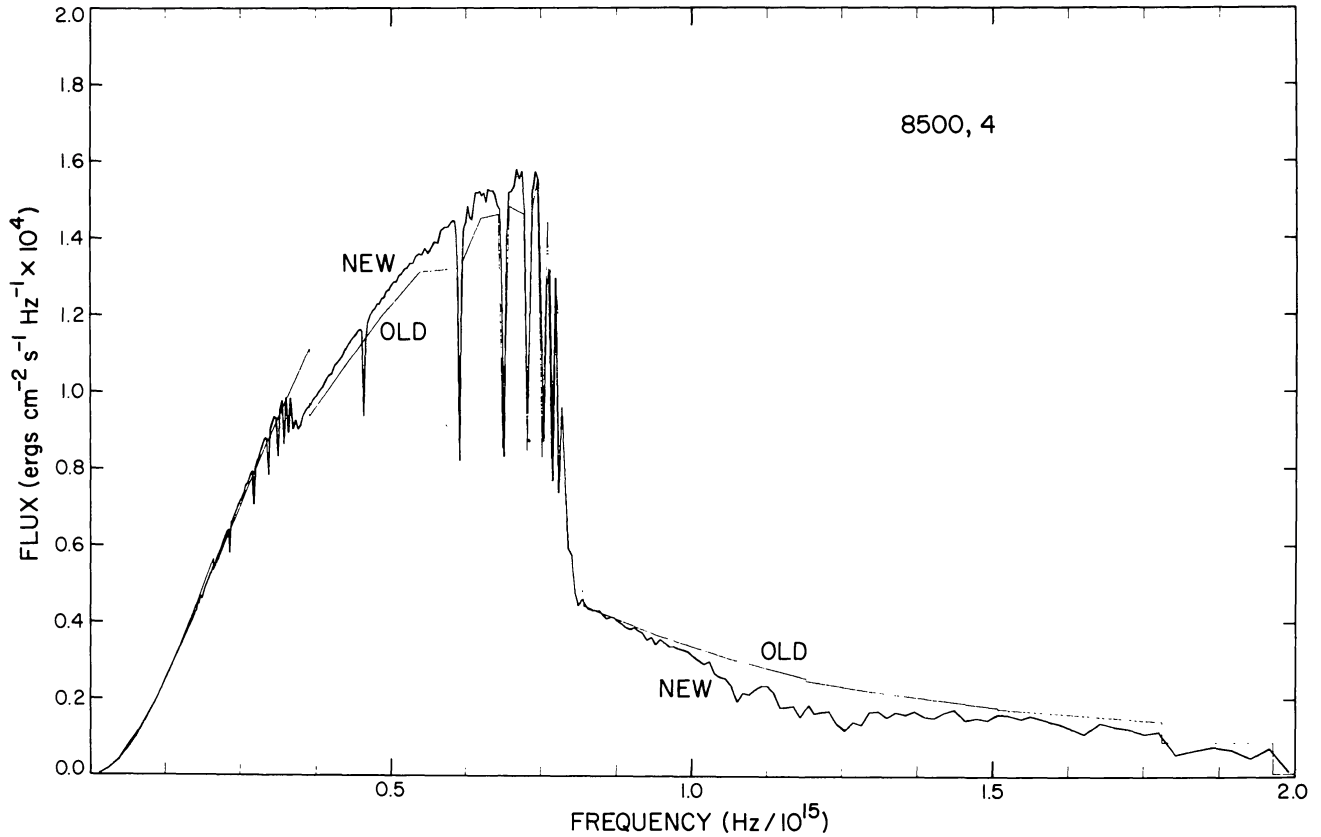


FIG. 2.—The effect on the flux F_v of increasing the line opacity for an 8500, 4 model

visible flux and slope, which makes up for the increased ultraviolet absorption. The area under the curves, the total flux, remains the same. An effective temperature determined from the visible color thus is sensitive to the opacity.

Figure 3 illustrates the effect on line profiles, specifically Balmer line profiles, which are used in gravity determinations. We see that the wings of the lines reflect the increased temperature gradient in the atmosphere and that the cores are deeper owing to

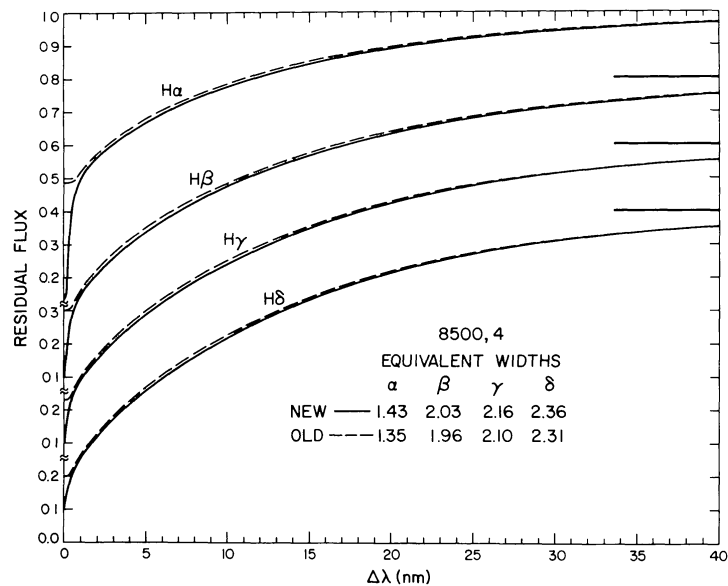


FIG. 3.—The effect on the Balmer line profiles of increasing the line opacity for an 8500, 4 model. The equivalent widths are given in nm.

the lower surface temperature. Depending on the model and the depth of formation, the line wings can be higher or lower and the equivalent widths of the lines can increase or decrease. In this case the lines are stronger. Thus the gravity determination from Balmer lines is sensitive to the opacity.

We find the same effects in the core and wings of metal lines: The equivalent width change affects the derived abundances and microturbulence. In the case where the core deepens and the wings rise, we have the curve of growth shown schematically in Figure 4. Since lines on the linear or flat part of the curve of growth do not have significant wings, the deeper core results in an increased equivalent width. Thus abundances derived from a model with too little opacity are systematically too large even for the weakest lines. Abundances for lines on the flat part of the curve of growth can be overestimated by large factors. The equivalent width of a line on the flat part of the curve of growth in a real star would be interpreted using an incorrect model as an indication of a high microturbulent velocity. The models presented in this paper are not perfect, so they too introduce such systematic errors, although, it is hoped, at a much lower level.

Since there are systematic errors in model atmospheres, the only safe strategy for determining abundances is, first, to choose a model that matches the observed energy distribution of the star (in the visible for lines in the visible). This model will have approximately the correct temperature gradient in the region of the atmosphere where the weak lines are formed, although it may have the wrong effective temperature and may not be able to reproduce the profiles of the strong lines. Second, only lines on the linear part of

the curve of growth should be used. Abundances are not reliable for any class of stars so faint that its weak lines have not yet been measured. Once abundances have been determined at high resolution, it may be possible to correlate them with features visible through lower-resolution spectra or photometry.

In this paper we use a statistical distribution-function representation for the opacity of atomic lines. We have computed distribution functions for abundances 10, 3, 1, 1/3, 1/10, 1/30, and 1/100 times solar and, thus far, models, fluxes, Balmer line profiles, and colors for solar and 1/10 and 1/100 times solar abundances. We discuss the distribution functions in a general way in § II and give computational details in § III. The model calculations are discussed in § IV. Section V discusses fluxes and Balmer line profiles and compares the calculations to observations. Colors and bolometric corrections are given in § VI. In § VII we compare our results with other grids of models. Next follow the tables of models, fluxes, Balmer line profiles, and colors. Finally, in an Appendix, we tabulate Rosseland mean opacities computed from the distribution functions. The colors are compared to observations in separate papers by Relyea and Kurucz (1978) and Buser and Kurucz (1978).

II. DISTRIBUTION FUNCTIONS FOR LINE OPACITY

The rationale for a statistical treatment of opacity is that the structure of a stellar atmosphere depends on integrals of the radiation field over frequency, such as the total flux at each depth, not on monochromatic quantities. Thus it might be expected that a statistical representation that removes the small-scale frequency

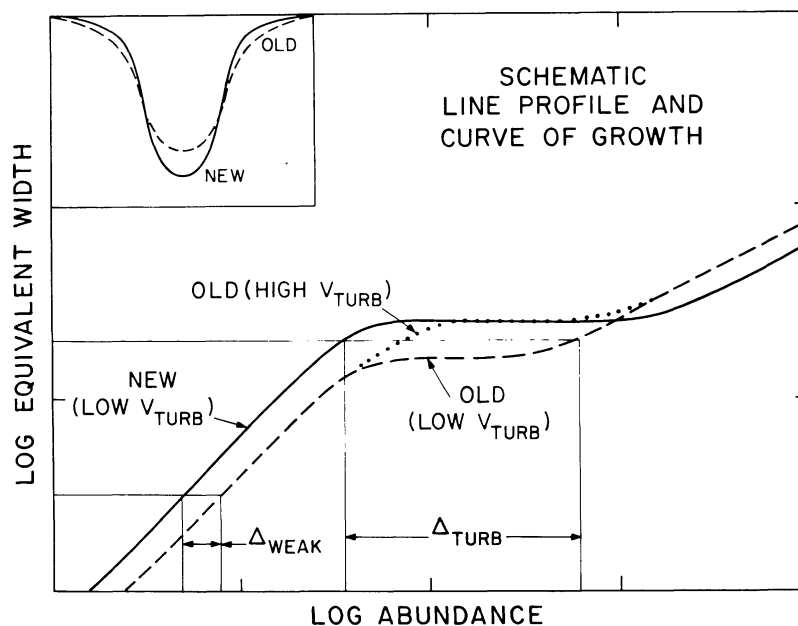


FIG. 4.—A schematic line profile and curve of growth, assuming no ionization changes, showing the effect of increasing the line opacity in the model atmosphere. For a given observed equivalent width, the new model predicts an abundance lower by Δ_{weak} for a weak line. For a line on the flat, microturbulently broadened part of the curve of growth, the new model predicts either an abundance lower by Δ_{weak} and a lower microturbulent velocity, or an abundance lower by Δ_{turb} with the same microturbulent velocity.

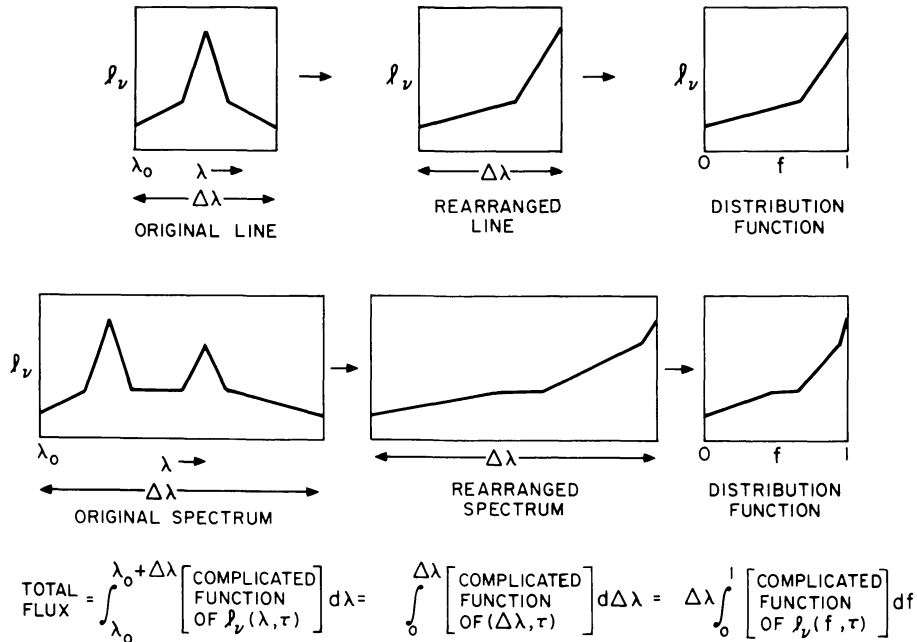


FIG. 5.—Schematic distribution functions. See text.

dependence of the opacity would, to a first approximation, not affect the integrals and would therefore be adequate for calculating model atmospheres. We can illustrate this with the simple example of a distribution-function representation for a single line profile. In Figure 5 we show the original absorption-coefficient profile and a new profile where the wavelength of each $d\lambda$ of the original profile has been discarded and the $d\lambda$'s have been rearranged so that l_ν is an increasing function. The rearranged profile produces the same total flux as the original. If we then normalize the length of the interval to 1, we obtain a distribution function that determines the fraction of the interval that has opacity l_ν or less. Integrating over the distribution function also produces the same total flux. If we treat a complicated spectrum in the same way, the distribution function is no more complicated computationally than that for a single line.

In representing line opacity by distribution functions, we make two implicit physical assumptions. The first is that the absorption-coefficient spectrum has the same relative shape at all depths in the atmosphere where line opacity is important as shown in Figure 6. These two cases have identical distribution functions at each depth. In Figure 6b the distribution function predicts the wrong optical depths because it assumes that the highest opacities always occur at the same frequencies. One way to investigate this effect is to compare distribution-function calculations to explicit line calculations. For example, see Carbon's (1974) discussion of distribution functions in his treatment of molecular opacity. Gustafsson *et al.* (1975) showed that this assumption did not produce a significant error in their models.

The second assumption is that either lines of different strengths are uniformly distributed through-

out the interval or the continuum source function and opacity do not vary radically over the frequency interval to which the distribution function applies, so that it makes no difference where in the interval the lines appear. If the interval for the distribution function is chosen such that strong opacity discontinuities are avoided, we obtain reasonably accurate results when the width of the interval is such that $\Delta\nu/\nu \lesssim 5-10\%$.

In practice, the spectrum is divided into a number of wavelength intervals and the distribution function is tabulated for a range of temperature, electron number or gas pressure, abundance, and micro-turbulent velocity. Figure 7 shows a wavelength

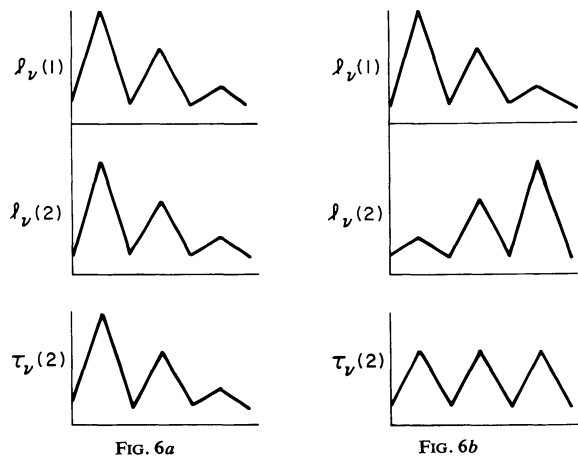


FIG. 6.—Schematic line absorption coefficient spectra at two depths. The distribution functions for Figs. 6a and 6b are identical at each depth, but the distribution functions for Fig. 6b would predict the wrong optical depth scale and the wrong radiation field.

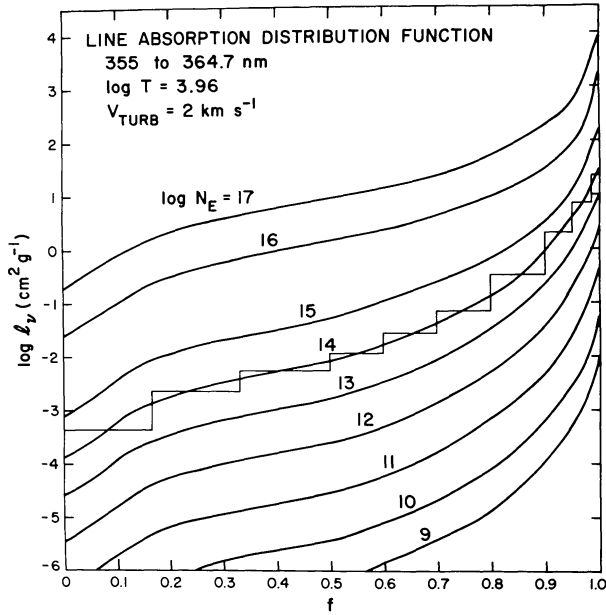


FIG. 7.—Sample distribution functions for a wavelength region just below the Balmer discontinuity for one temperature and nine values of the electron density. In practice, the distribution functions are represented by step functions, as indicated on the curve for $\log N_e = 14$.

region just below the Balmer discontinuity for one temperature and nine values of the electron density. Note how, as the density decreases, the maximum, which represents line cores, decreases owing to ionization, and how the wings decrease even more as the broadening is reduced at low densities. Computationally, the distribution functions can be represented by step functions, as indicated on the curve for $N_e = 14$. For each step i , the total opacity for each level of the atmosphere, the optical depth, the source function, and the radiation moments are evaluated as follows:

$$\tau_{vi} = \int_0^M (\kappa_v + \sigma_v + l_{vi}) dM, \tag{1}$$

$$S_{vi} = (\kappa_v \bar{S}_v + l_{vi} B_v + \sigma_v J_{vi}) / (\kappa_v + l_{vi} + \sigma_v), \tag{2}$$

$$J_{vi} = \frac{1}{2} \int_0^{\tau_{vi}} S_{vi} E_1(\tau_{vi} - t) dt + \frac{1}{2} \int_{\tau_{vi}}^{\infty} S_{vi} E_1(t - \tau_{vi}) dt, \tag{3}$$

$$H_{vi} = -\frac{1}{2} \int_0^{\tau_{vi}} S_{vi} E_2(\tau_{vi} - t) dt + \frac{1}{2} \int_{\tau_{vi}}^{\infty} S_{vi} E_2(t - \tau_{vi}) dt, \tag{4}$$

and

$$K_{vi} = \frac{1}{2} \int_0^{\tau_{vi}} S_{vi} E_3(\tau_{vi} - t) dt + \frac{1}{2} \int_{\tau_{vi}}^{\infty} S_{vi} E_3(t - \tau_{vi}) dt, \tag{5}$$

where M is the mass per unit area, κ_v and σ_v are the

continuous absorption and scattering coefficients, l_{vi} is the line absorption coefficient of the step, τ_{vi} is the optical depth, B_v is the Planck function, \bar{S}_v is the continuum source function, S_{vi} is the source function, J_{vi} is the mean intensity, H_{vi} is the flux moment, and K_{vi} is the pressure moment. Monochromatic quantities are found by integrating over the distribution function through simple addition of the steps,

$$J_v = \int_0^1 J_v(f_v) df_v = \sum_{i=1}^{N_v} w_{vi} J_{vi}, \tag{6}$$

$$H_v = \int_0^1 H_v(f_v) df_v = \sum_{i=1}^{N_v} w_{vi} H_{vi}, \tag{7}$$

and

$$K_v = \int_0^1 K_v(f_v) df_v = \sum_{i=1}^{N_v} w_{vi} K_{vi}, \tag{8}$$

where w_{vi} is the width of step i .

III. DISTRIBUTION FUNCTIONS FOR THIS GRID

The opacity calculation by Kurucz, Peytremann, and Avrett (1974, hereafter KPA) has been repeated with several significant improvements. First, the temperature range has been extended to cooler temperatures and a closer spacing has been adopted to improve the accuracy of interpolation from the final tables. The temperatures are listed in Table 1. Second, the state variable was changed from pressure to electron number, also listed in Table 1. This change has the great computational advantage that the metal line opacity scales with abundance at a given temperature and electron number, for fixed hydrogen and helium abundance, so that only one calculation is

TABLE 1
TABULATED TEMPERATURES AND ELECTRON NUMBER DENSITIES

log T	log N _e								
	17	16	15	14	13	12	11	10	9
3.48.....							×	×	×
3.52.....							×	×	×
3.56.....					×	×	×	×	×
3.60.....					×	×	×	×	×
3.64.....				×	×	×	×	×	×
3.68.....				×	×	×	×	×	×
3.72.....				×	×	×	×	×	×
3.76.....		×	×	×	×	×	×	×	×
3.80.....		×	×	×	×	×	×	×	×
3.84.....		×	×	×	×	×	×	×	×
3.88.....		×	×	×	×	×	×	×	×
3.92.....		×	×	×	×	×	×	×	×
3.96.....		×	×	×	×	×	×	×	×
4.00.....	×	×	×	×	×	×	×	×	×
4.10.....	×	×	×	×	×	×	×	×	×
4.20.....	×	×	×	×	×	×	×	×	×
4.30.....	×	×	×	×	×	×	×	×	×
4.40.....	×	×	×	×	×	×	×	×	×
4.50.....	×	×	×	×	×	×	×	×	×
4.60.....	×	×	×	×	×	×	×	×	×
4.70.....	×	×	×	×	×	×	×	×	×
4.80.....	×	×	×	×	×	×	×	×	×
4.90.....	×	×	×	×	×	×	×	×	×
5.00.....	×	×	×	×	×	×	×	×	×

TABLE 2
FREQUENCY INTERVALS

Integration Wavelength	Distribution Function		Integration Wavelength	Distribution Function		Integration Wavelength	Distribution Function	Integration Wavelength	Distribution Function
	Interval	Subintervals		Interval	Subintervals				
22.9	22.79409	23.2	230.	225.	227.5	230.	232.5		
23.4			240.	235.	237.5	240.	242.5		
24.3	23.65221		248.1	245.	247.5	250.			
25.2	25.00744	25.46614	258.1	251.38152	252.5	255.	257.5	260.	262.5
25.6			270.	265.	267.5	270.	272.5		
26.0	25.90000	26.14316	280.	275.	277.5	280.	282.5		
26.6			290.	285.	287.5	290.	292.5		
27.5	27.1	28.09263	300.	295.	297.5	300.	302.5		
28.3			310.	305.	307.5	310.	312.5		
29.3	28.65871		320.	315.	317.5	320.	322.5		
30.1	29.95849	30.26260	330.	325.	327.5	330.	332.5		
30.9			340.	335.	337.5	340.	342.5		
32.5	31.7		350.	345.	347.5	350.	352.5		
34.2	33.5	34.96998	359.8	355.	357.5	360.	362.5		
35.1			366.1	364.70552	367.5	370.	372.5		
35.6	35.25000	36.14101	368.7						
36.5			371.2						
37.5	37.	38.01600	373.7						
38.4			380.	375.	377.5	380.	382.5		
40.	38.96642		390.	385.	387.5	390.	392.5		
41.5	41.15492	41.879	402.5	395.	397.5	400.	402.5	405.	407.5
42.5			420.	410.	412.5	415.	417.5	420.	422.5
44.5	43.3		440.	430.	432.5	435.	437.5	440.	442.5
47.2	45.9		460.	450.	452.5	455.	457.5	460.	462.5
49.4	48.52000		480.	470.	472.5	475.	477.5	480.	482.5
50.6	50.43022	50.876	500.	490.	492.5	495.	497.5	500.	505.
51.6			520.	510.	515.	520.	525.		
54.	52.5		540.	530.	535.	540.	545.		
56.4	55.5		560.	550.	555.	560.	565.		
58.7	57.41000		580.	570.	575.	580.	585.		
61.2	60.		605.	590.	595.	600.	605.	610.	615.
64.0	62.5		635.	620.	625.	630.	635.	640.	645.
67.1	65.53786		665.	650.	655.	660.	665.	670.	675.
70.5	68.8		695.	680.	685.	690.	695.	700.	705.
73.6	72.24011		730.	710.	720.	730.	740.		
77.	75.		770.	750.	760.	770.	780.		
81.	79.		805.2	790.	800.	810.			
85.	83.		835.2	820.58743	830.	840.			
89.	87.		875.	850.	860.	870.	880.	890.	
93.	91.17638	93.	925.	900.	910.	920.	930.	940.	
97.5	95.	97.5	975.	950.	960.	970.	980.	990.	
102.5	100.	102.5	1025.	1000.	1010.	1020.	1030.	1040.	
107.5	105.	107.5	1075.	1050.	1060.	1070.	1080.	1090.	
112.5	110.09203	112.5	1125.	1100.	1110.	1120.	1130.	1140.	
117.5	115.	117.5	1175.	1150.	1160.	1170.	1180.	1190.	
121.9	120.	122.	1225.	1200.	1210.	1220.	1230.	1240.	
126.9	123.96176	127.	1275.	1250.	1260.	1270.	1280.	1290.	
132.5	130.	132.5	1325.	1300.	1310.	1320.	1330.	1340.	
137.5	135.	137.5	1375.	1350.	1360.	1370.	1380.	1390.	
142.2	140.	142.2	1429.4	1400.	1410.	1420.	1430.	1440.	1450.
148.2	144.40176	147.	1479.4	1458.82209	1470.	1480.	1490.		
154.5	152.00002	154.5	1550.	1500.	1520.	1540.	1560.	1580.	
159.5	157.	159.5	1650.	1600.	1620.	1640.	1660.	1680.	
164.9	162.15071	165.	1675.						
171.3	167.67209	170.	1800.						
179.	175.	177.5	2700.						
187.	183.	185.	4000.						
194.4	191.	193.	5000.						
202.8	197.84471	200.	6500.						
211.3	207.75641	210.	10000.						
220.	215.	217.5	20000.						

Balmer lines

Balmer lines

Paschen lines

Brackett lines

Lyman lines

needed to determine the distribution function for all abundances. Hydrogen and helium must remain fixed because they are the van der Waals perturbers that broaden the strong lines. Unfortunately, in regions where hydrogen or helium lines provide the dominant opacity, scaling does not work, so those regions must be recalculated when the metal abundances are changed. In practice, we recalculated only for wavelength intervals having the hydrogen Lyman, Balmer, Paschen, and Brackett lines as indicated in Table 2.

We did not directly evaluate the distribution function at every value of T and N_e since many of the combinations would not occur in the model atmos-

pheres, namely, high temperatures at low densities and low temperatures at high densities. Table 1 indicates the values at which the calculations were performed. To simplify interpolation, the distribution-function tables have been filled out by logarithmic linear extrapolation.

One change was made in the adopted solar abundances: iron was increased from -4.65 to -4.50 relative to the total number of atoms, which we prefer from our own experiments with weak lines. The adopted solar abundances taken from Withbroe's (1971) compilation or Allen (1963) are listed in Table 3. The values listed are logarithmic abundances relative

to the total. We assumed 0.9 hydrogen and 0.1 helium by number in all these calculations.

The final important change in the distribution-function calculation was to improve the wavelength resolution by modifying the program to calculate simultaneously distribution functions for a large wavelength interval and for smaller subintervals. Thus two sets of distribution functions were tabulated, one with nominally 10 nm intervals to be used to calculate the models, and a second with nominally 2.5 nm intervals to be used to calculate surface fluxes once the models had converged. The higher resolution is needed to calculate intermediate-band colors. The wavelength intervals are listed in Table 2. Since the Balmer discontinuity is such a dominant feature in stars, the smaller intervals in the region 365–375 nm were used in both sets to improve integration across the discontinuity. For wavelengths longward of the last interval, the last interval was assumed to extend to infinity.

For line data we used the list computed by Kurucz and Peytremann (1975). To simplify the calculation, the data were edited down to fewer than 1,000,000 lines from the original 1,760,000 by eliminating lines with gf -values less than 10^{-5} when the lower energy level was greater than $15,000 Z_{\text{eff}} \text{ cm}^{-1}$, where Z_{eff} (the effective charge) is 1 for neutrals, 2 for once ionized atoms, etc. We have assumed that the summed opacity

of the deleted lines is insignificant, but we have not been able to test the assumption, as it would require recomputing the distribution function. A magnetic tape containing the line data can be obtained from the author.

We selected line data for each distribution-function interval slightly beyond both ends to be sure to pick up the wings of lines in neighboring intervals. There were between 15,000 and 30,000 lines per interval above the Lyman limit, with a falling off of the number in the Lyman continuum owing to a shortage of spectral information on multiply ionized atoms.

For each interval we calculated the total absorption coefficient at points evenly spaced in wavelength such that $\Delta\lambda/\lambda_{\text{center}} = 2.5E-6$, where λ_{center} is the center of the interval. This spacing produced several points per Doppler width in the Voigt profile of each line. To save time, we used a minimum cutoff of 1/1000 of the continuum opacity to limit the spread of the line wings. The wing opacity is due to radiative, van der Waals, and Stark broadening, which are approximated as follows in the present calculation:

A. The radiative damping constant is assumed equal to the classical damping constant:

$$\Gamma_R = 2.223E13/\lambda_{\text{center}}^2 \text{ (in } s^{-1}, \lambda \text{ in nm)} \quad (9)$$

(see the discussion by Peytremann 1972).

TABLE 3
ABUNDANCES

Atomic Number	Element	Abundance	Atomic Number	Element	Abundance	Atomic Number	Element	Abundance
1.....	H	-0.05	34.....	Se	-8.80	67.....	Ho	-11.50
2.....	He	-1.00	35.....	Br	-9.40	68.....	Er	-11.29
3.....	Li	-11.45	36.....	Kr	-8.80	69.....	Tm	-11.62
4.....	Be	-10.99	37.....	Rb	-9.42	70.....	Yb	-11.24
5.....	B	-9.25	38.....	Sr	-9.23	71.....	Lu	-11.21
6.....	C	-3.48	39.....	Y	-10.43	72.....	Hf	-11.40
7.....	N	-3.99	40.....	Zr	-9.63	73.....	Ta	-11.70
8.....	O	-3.22	41.....	Nb	-9.75	74.....	W	-9.48
9.....	F	-7.49	42.....	Mo	-10.15	75.....	Re	-11.40
10.....	Ne	-4.60	43.....	Tc	-20.00	76.....	Os	-11.30
11.....	Na	-5.81	44.....	Ru	-10.48	77.....	Ir	-9.84
12.....	Mg	-4.51	45.....	Rh	-10.50	78.....	Pt	-10.40
13.....	Al	-5.65	46.....	Pd	-10.48	79.....	Au	-11.73
14.....	Si	-4.50	47.....	Ag	-11.38	80.....	Hg	-9.05
15.....	P	-6.62	48.....	Cd	-10.08	81.....	Tl	-11.85
16.....	S	-4.84	49.....	In	-10.34	82.....	Pb	-10.18
17.....	Cl	-6.40	50.....	Sn	-10.34	83.....	Bi	-11.25
18.....	Ar	-5.40	51.....	Sb	-10.40	84.....	Po	-20.00
19.....	K	-7.00	52.....	Te	-10.00	85.....	At	-20.00
20.....	Ca	-5.72	53.....	I	-10.60	86.....	Rn	-20.00
21.....	Sc	-8.98	54.....	Xe	-10.00	87.....	Fr	-20.00
22.....	Ti	-7.31	55.....	Cs	-10.90	88.....	Ra	-20.00
23.....	V	-7.95	56.....	Ba	-10.15	89.....	Ac	-20.00
24.....	Cr	-6.35	57.....	La	-10.24	90.....	Th	-11.23
25.....	Mn	-6.85	58.....	Ce	-10.41	91.....	Pa	-20.00
26.....	Fe	-4.50	59.....	Pr	-10.42	92.....	U	-11.45
27.....	Co	-7.55	60.....	Nd	-10.23	93.....	Np	-20.00
28.....	Ni	-5.77	61.....	Pm	-20.00	94.....	Pu	-20.00
29.....	Cu	-7.60	62.....	Sm	-10.39	95.....	Am	-20.00
30.....	Zn	-7.63	63.....	Eu	-11.56	96.....	Cm	-20.00
31.....	Ga	-9.21	64.....	Gd	-10.93	97.....	Bk	-20.00
32.....	Ge	-8.73	65.....	Tb	-11.60	98.....	Cf	-20.00
33.....	As	-9.70	66.....	Dy	-10.94	99.....	Es	-20.00

B. The van der Waals damping constant is approximated by

$$\Gamma_w = \frac{n_{\text{eff}}^2}{z_{\text{eff}}} 17 \left(\frac{8kT}{\pi M} \right)^{0.3} \times [(1.61E-33)^{0.4} N_H + (\frac{1}{4})^{0.3} (0.50E-33)^{0.4} N_{\text{He}}] \quad (\text{s}^{-1}), \quad (10)$$

where in the usual hydrogenic expression $[(n_{\text{eff}}^2/z_{\text{eff}})^2]^{0.4}$ has been replaced by $n_{\text{eff}}^2/z_{\text{eff}}$ and the mass has not been reduced (to save computation time). Here, n_{eff} is the effective quantum number of the upper energy level, z_{eff} is the effective charge, and N_H and N_{He} are hydrogen and helium number densities. This expression is probably an underestimate since multiplicative factors of 2–6 usually must be introduced to make calculated damping constants agree with observations.

C. The Stark damping constant is a fit by Peytremann to detailed calculations by Sahal-Bréchet and Segré (1971):

$$\Gamma_s = 1.0E-8 n_{\text{eff}}^5 N_e \quad (\text{s}^{-1}). \quad (11)$$

Hydrogen lines are added separately to the total line-absorption coefficient by using the approximate Stark-profile algorithm found in subroutines HLINOP and STARK of the model atmosphere program ATLAS (Kurucz 1970). A microturbulent velocity of 2 km s^{-1} was adopted.

After the total line-absorption coefficient has been calculated for every wavelength point in the region, the fraction of the total number of points that fall below each 1/10 decade in opacity is determined. This distribution function is interpolated to yield the opacity at 60 evenly spaced points ($f = 1/120$ to $119/120$), forming a 60-step histogram.

In practice, fewer than 60 steps are required to represent the line opacity adequately, so several steps are averaged together to form wider ones. A table of the resulting step functions is written on tape for each interval for use in ATLAS. For this grid we have taken 10 steps: 10/60, 10/60, 10/60, 6/60, 6/60, 6/60, 6/60, 3/60, 2/60, and 1/60, as in Figure 7 for $\log N_e = 14$.

IV. MODELS

a) Model Atmosphere Program

Several modifications have been made to ATLAS (Kurucz 1970) in the course of this work, which include changes in the temperature correction, radiation pressure, convection, and distribution functions, and correction of some minor numerical instabilities and bugs.

In ATLAS5 (Kurucz 1970) the depth variable is mass per square centimeter and the flux temperature correction determines a mass perturbation that changes the temperature to reduce the flux error. However, the physical variable for the radiation field is an optical depth scale. At high temperature the mass and optical depth scales vary in a similar fashion be-

cause the gas is mostly ionized, but at lower temperatures the optical depth scale becomes a very strong function of temperature because of ionization and Boltzmann population changes. Thus the mass correction tends to be slowly convergent or even unstable. To correct this problem, the temperature correction was changed from a mass to an optical depth correction by replacing dM in the perturbation equations by using

$$dM = d\tau_{\text{Ross}} / \langle \kappa_v + l_v + \sigma_v \rangle_{\text{Ross}} \quad (12)$$

and perturbing for $\Delta\tau_{\text{Ross}}$ instead of ΔM , where M is the mass per unit area and τ_{Ross} is the Rosseland optical depth. Then

$$\Delta T = -\Delta\tau_{\text{Ross}} \frac{dT}{d\tau_{\text{Ross}}}. \quad (13)$$

However, for the τ correction to work, the model must be defined on a fixed τ scale. To accomplish this while using mass as the variable, we determine an additional mass correction ΔM that approximately maintains the same Rosseland depth scale from iteration to iteration. This is found through approximate integration of equation (12) before and after the temperature correction, using Rosseland opacity pretabulated as a function of temperature and pressure (see Appendix). Then

$$\Delta M = M(T) - M(T + \Delta T). \quad (14)$$

There are several implicit assumptions in ATLAS5 about the radiation energy density and pressure that in some cases can affect the thermodynamic derivatives that determine the adiabatic gradient and, consequently, the convective flux. These approximations are now made more explicitly so that they can be removed if necessary.

The radiation pressure and the partial derivatives

$$\left(\frac{\partial P_{\text{rad}}}{\partial T} \right)_P, \left(\frac{\partial P_{\text{rad}}}{\partial P} \right)_T, \left(\frac{\partial E_{\text{rad}}}{\partial T} \right)_P, \left(\frac{\partial E_{\text{rad}}}{\partial P} \right)_T$$

are required to evaluate the thermodynamic expressions, where

$$P_{\text{rad}} = \frac{4\pi}{c} \int K_v dv \quad (15)$$

and the energy density per unit mass is

$$E_{\text{rad}} = \frac{4\pi}{\rho c} \int J_v dv, \quad (16)$$

with ρ the mass density. In an isotropic medium $J_v = 3K_v$, so $E_{\text{rad}} = 3P_{\text{rad}}/\rho$. This approximation was used in ATLAS5 and in the models presented here. At the top of the atmosphere the approximation can be in error by as much as 25%; but as the energy density affects the model only through the convective flux and, in these models, the convection zone starts at depths that are becoming optically thick, this approximation should not cause significant errors.

We save time in computing the radiation pressure by integrating the radiative acceleration instead of computing K directly. Using

$$\frac{dK_v}{dM} = (\kappa_v + l_v + \sigma_v)H_v, \quad (17)$$

we have

$$P_{\text{rad}} = \int_0^M \frac{4\pi}{c} \int (\kappa_v + l_v + \tau_v)H_v dv dM + P_{\text{rad}}(0) \quad (18)$$

$$= \int_0^M a_{\text{rad}} dM + P_{\text{rad}}(0), \quad (19)$$

where

$$P_{\text{rad}}(0) = \frac{4\pi}{c} \int K_v(0) dv. \quad (20)$$

Here, P_{rad} is the radiation pressure and a_{rad} is the radiative acceleration. Since the constant $P_{\text{rad}}(0)$ does not affect the gas pressure found through integrating the hydrostatic equilibrium equation but only adds to the total pressure, it was taken to be 0 in ATLAS5. In the models presented here, $K_v(0)$ was computed and $P_{\text{rad}}(0)$ was included explicitly because the thermodynamic derivatives can be affected. Unfortunately, it is impractical to compute these derivatives rigorously by recomputing the radiation field, so various approximations still must be used. For the optically thick isotropic case the radiation pressure varies as T^4 and is independent of the gas pressure,

$$\left(\frac{\partial P_{\text{rad}}}{\partial T}\right)_P = \frac{4P_{\text{rad}}}{T} \quad (21)$$

and

$$\left(\frac{\partial P_{\text{rad}}}{\partial P}\right)_T = 0. \quad (22)$$

At the surface,

$$\left(\frac{\partial P_{\text{rad}}}{\partial T}\right)_P = 0 \quad (23)$$

because the radiation field is not affected by local conditions but is formed deeper in the atmosphere. An approximate interpolating formula is required between the two cases. In ATLAS5 we used

$$\left(\frac{\partial P_{\text{rad}}}{\partial T}\right)_P = \frac{4[P_{\text{rad}} - P_{\text{rad}}(0)]}{T}. \quad (24)$$

For these models we used

$$\left(\frac{\partial P_{\text{rad}}}{\partial T}\right)_P = \frac{4P_{\text{rad}}}{T} [1 - \exp(-\tau_{\text{Ross}})]. \quad (25)$$

We do not know whether either approximation is preferable.

Modifications were also made to ATLAS in the treatment of the opacity steps. Since the same step widths are used to fit the distribution functions at all wavelengths, even when line opacity does not fill the interval, an algorithm was adopted to delete superfluous steps. At each frequency the continuum opacity and radiation field are calculated and stored. Then the line opacity is read in and combined with the continuous opacity starting with the highest step. The radiation field is calculated for the step. If the residual flux at any depth is less than 0.999, i.e., the line opacity is significant, the calculation continues to the next step and the test is repeated. Otherwise, all succeeding, lesser steps are assumed to be continuum and so are not calculated. This procedure results in a considerable saving in computer time.

The new version of the program, called ATLAS6, includes the modifications described above and can be obtained from the author together with the distribution functions. Also available are the updated abundance analysis program WIDTH6 that determines the abundance required to match an observed equivalent width or calculates curves of growth and an ATLAS6 subroutine XLINOP that computes line opacity for up to 1000 atomic and molecular lines with provision for isotopes.

b) Grid of Models

The models were computed with the program ATLAS6 assuming plane-parallel geometry, hydrostatic equilibrium, local thermodynamic equilibrium, no molecules in the equation of state, and radiative plus convective energy transport. The mixing-length to scale-height ratio was assumed to be 2 instead of the usual 1–1.5 because our convective formulation tends to produce a lower convective flux than other formulations such as that of Mihalas (1970). The convective flux was always computed; but for hotter models where it was not significant, the models were assumed to be strictly radiative. Continuous opacities were included for H I and H II, He I–He III, C I–C IV, N II–N V, O II–O VI, Ne I–Ne VI, Mg I, Al I, Si I, H_2^+ , H^- , H Rayleigh scattering, and electron scattering. Three sets of abundances were used: solar as given in Table 3, 1/10 times solar, and 1/100 times solar, where all elements but hydrogen and helium were reduced by a constant factor.

Forty mass depth points were chosen to have Rosseland optical depths running from approximately $\log \tau_{\text{Ross}} = -4.5$ to 2.0 with six points per decade. In depth integrals either the first depth point was taken to be 0 or the integrand was extrapolated to 0 depth. Frequency integrations used the 122 wavelengths listed in Table 2 with trapezoidal integration in frequency. At 0 frequency and at the frequency corresponding to 22.4 nm there was assumed to be no radiation. For cooler models the Lyman continuum emits so little radiation that it was ignored without affecting the integrals.

Radiative models were converged to flux errors of a few tenths of a percent and flux derivatives to the

order of 1%, except at the top few points where the derivative was left on the order of 10%. The convective models were very slowly convergent and had flux errors in the convective zone, which, in some cases, were as large as 3% with alternating signs. In all cases the flux correction was reduced to a few tenths of a degree and the temperature structure and radiation field were converged, except at the first few points where there is a large temperature drop.

The model atmospheres are presented in Table 4 (see pages 31 and 33). A list of the models is given in Table 5 (see pages 31 and 175). There are 140 solar abundance models ranging in effective temperature from 5500 to 50,000 K computed at steps of 0.5 in $\log g$ down to the radiation pressure limit. A model 0.5 lower in $\log g$ than the lowest gravity model given cannot be computed in hydrostatic equilibrium. Also included are a solar model and models for Vega, which will be described in § VI. The 1/10 and 1/100 times solar abundance models were computed only for a limited range of six gravities for temperatures from 5500 to 10,000 K.

To compress the tables as much as possible, all quantities except temperature are given in log cgs units. The columns are mass cm^{-2} , Rosseland optical depth, continuum optical depth at 500 nm, geometric depth down from the first point, temperature, gas pressure, electron number density, atomic number density, mass density, Rosseland mass absorption coefficient, continuum mass absorption coefficient at 500 nm, radiation pressure, radiative acceleration (compare to $\log g$), and the fraction of the total flux carried by convection. A value of 0 in the table means an actual 0, not 10^0 . A label in the heading for each model tells whether the model was treated as purely radiative or radiative plus convective. The 40 depths listed in the table are the actual depths that were used in the calculation.

These models are available on tape or cards from the author.

c) Discussion

We experienced no significant numerical problems, and these models are as good as, or, in most cases, significantly better than earlier work, as discussed in § VII. Nevertheless, we expect to include improvements to our numerical procedures in future calculations. In the current grid we do not go to shallow enough optical depths to compute the temperature drop at the surface accurately. Test calculations with 99 depths indicate that a good approximation to the actual behavior at small depths can be found by linearly extrapolating the temperature from the third and fourth points to shallower depths. We plan to use 64 depths in future calculations going to at least $\log \tau_{\text{Ross}} = -6$ and adding more points per decade.

Several ATLAS users have pointed out that our integration for the radiation field (Kurucz 1970) assumes a smooth source function variation at small depths, which is not the case if there is a temperature drop. In future calculations we plan to add additional

shallow optical depths to the integration. We expect this change to improve the convergence of the flux derivative.

The addition of more points per decade should improve the evaluation of the derivatives in the convection zone and improve convergence of the convective flux. In any case our treatment of convection is uncertain. Once we are able to make detailed comparisons to observations, especially at the H^- opacity minimum at $1.64 \mu\text{m}$, where the convective layers of an atmosphere are visible for some stars, we may adopt another mixing length, or another convective formulation altogether.

We computed a $T_{\text{eff}} = 10,000 \text{ K}$, $\log g = 4$ test model using all the wavelengths given in Table 6 (see pages 31 and 184), which are 3 times as many as those used in this grid calculation. We did not find a significant difference in the models. However, we do expect that additional wavelengths are required in the far-ultraviolet for high-temperature models where the flux peaks in the ultraviolet. Also, the cooler models, especially once molecules are included, will probably require more wavelengths.

The cooler models in this grid should be recomputed with molecules in the equation of state and with molecular line opacities. We are currently making up a list of the required diatomic molecular lines.

In using the lowest-gravity models, the reader should consider that our assumptions of plane-parallelism, hydrostatic equilibrium, and LTE become less realistic.

V. FLUXES, COLORS, BOLOMETRIC CORRECTIONS, AND BALMER LINE PROFILES

a) Fluxes

Once the models were converged using the wavelengths listed in Table 2, the surface flux was computed at higher resolution at the wavelengths given in Table 6. That table lists flux per unit wavelength, $F_{\lambda}(=4H_{\lambda})$, and blocking fractions, which are 1 minus the ratio of the actual flux to the continuum flux in each wavelength interval. These data are available on magnetic tape from the author.

Figures 8–20 present an overall impression of the solar abundance models. Figures 8–13 present F_{ν} on a linear scale to show the relative contributions to the flux integral as the temperature increases from 6000 to 25,000 K and the flux maximum moves to the ultraviolet. Note that our resolution is high enough to show the hydrogen lines: $\text{L}\alpha$ at 2.5×10^{15} , the Balmer series from 0.25 to 0.8×10^{15} , and the Paschen series from 0.25 to 0.4×10^{15} Hz. The Lyman, Balmer, and Paschen discontinuities are apparent at 3.3, 0.8, and 0.4×10^{15} Hz, respectively. The strong line absorption in the Balmer continuum is apparent.

Figures 14–18 show $\log F_{\nu}$ and $\log F_{\lambda}$ for most of the $\log g = 4$ models for the ultraviolet wavelength and frequency intervals observable from space and for intervals observable from the ground.

Figure 19 shows the visible colors of most of the $\log g = 4$ models. These are magnitudes normalized

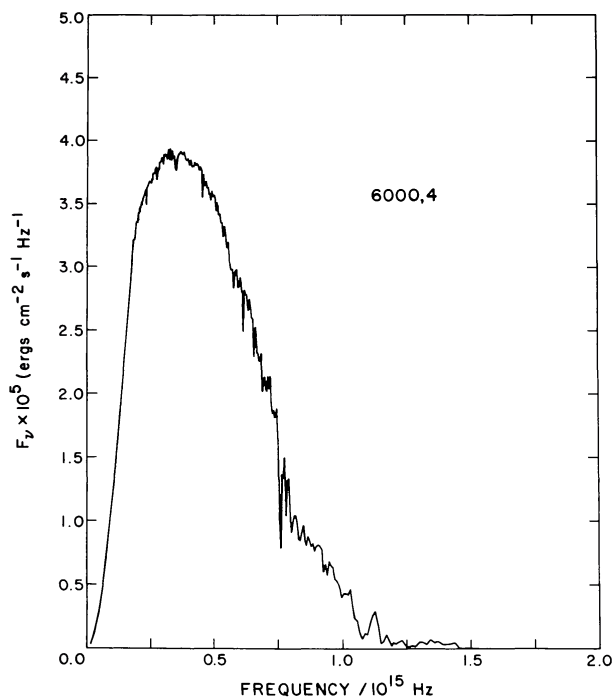


FIG. 8.—Flux F_ν for the 6000, 4 solar abundance model. In Figs. 8–13, the increased flux in the Balmer continuum and the shift of the flux maximum to the ultraviolet should be noted. As the temperature increases, the Paschen, Balmer, and Lyman discontinuities become visible, as well as individual Paschen, Balmer, and Lyman lines.

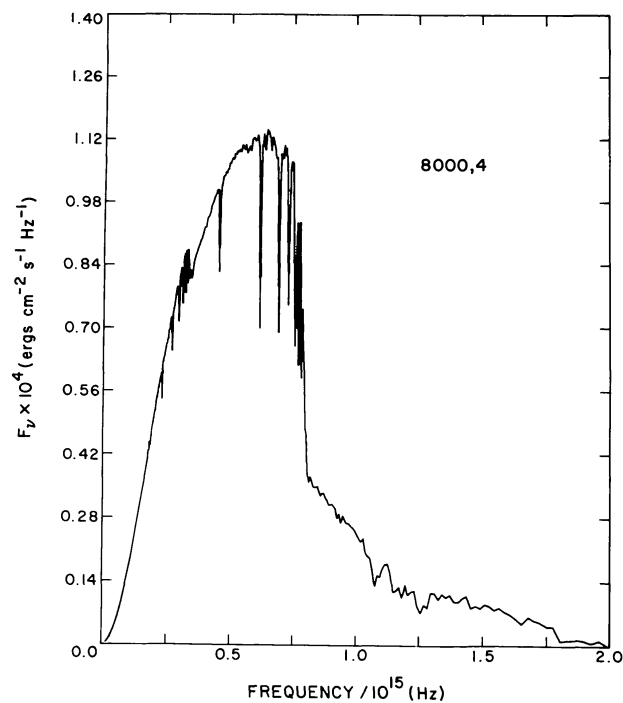


FIG. 10.—Same as Fig. 8 for 8000, 4

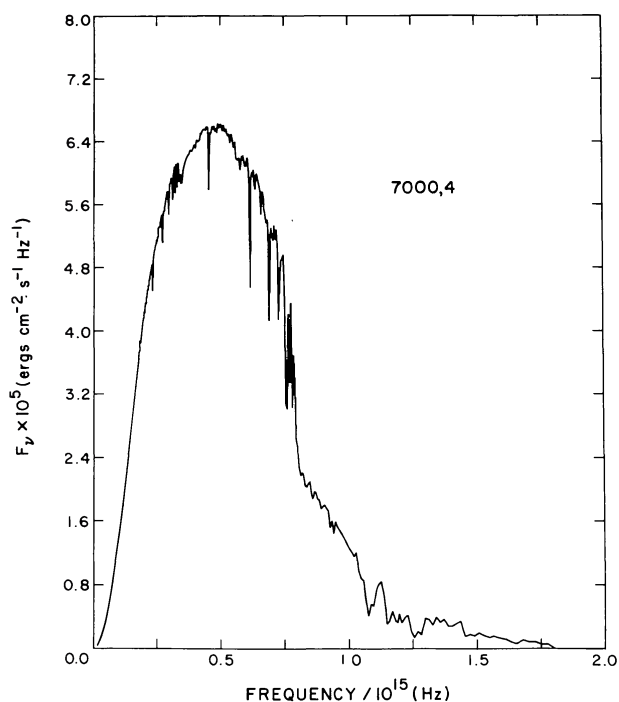


FIG. 9.—Same as Fig. 8 for 7000, 4

at $1.8 \mu\text{m}^{-1}$, the approximate position of the V filter. The dramatic change in the Balmer continuum relative to V as the temperature increases is obvious, as are the change in color in the visible and the limiting color in the infrared, visible, and ultraviolet at high temperatures.

Finally, Figure 20 shows F_ν over the whole frequency range for the hottest models for both the lowest and the highest-gravity model computed. Note the Balmer limit at 0.8×10^{15} , the Lyman limit at 3.3×10^{15} , the He I limit at 6.0×10^{15} , and the He II limit at 13.0×10^{15} Hz. A strong effect on the energy distribution is apparent in the 35,000 K models above and below the Lyman limit as the gravity is reduced. This results from ionizing He I and removing its opacity, thereby reducing the temperature gradient.

b) Colors and Bolometric Corrections

Schild, Peterson, and Oke (1971) were able to match the energy distribution for Vega observed by Oke and Schild (1970) with a model that included line opacity only for hydrogen. However, KPA could not match the energy distribution with models that included a more realistic opacity. Because of this discrepancy, KPA were not able to calibrate their UBV colors by transforming the theoretical colors for Vega to match the observed colors but, instead, adopted the color calibration of Matthews and Sandage (1963). Furthermore, there was an artifact in the computed energy distribution for the 8000 and 8500 K models just to the red of the Balmer discontinuity that could contaminate the U magnitude, which caused KPA concern about the accuracy of the

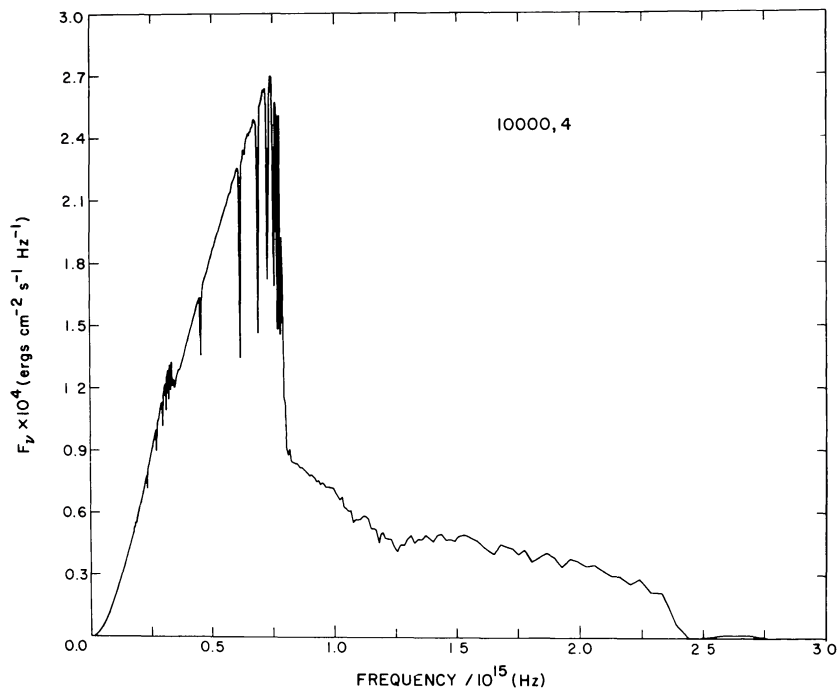


FIG. 11.—Same as Fig. 8 for 10,000, 4

model calculation. However, they decided that since only a few of their lowest-temperature models were affected, there would not be serious problems with the grid as a whole.

Systematic errors have been found in the *UBV* colors predicted by KPA: up to -0.05 in $B - V$ and up to -0.20 in $U - B$. An investigation of the difficulties encountered by KPA and of the errors in the colors led to the identification of three separate problems that have been corrected or, at least, substantially reduced in this work.

First, the Oke and Schild calibration for Vega has been revised. Careful reading of their paper and one by Hayes (1970) and conversations with Drs. Schild, Hayes, and Latham identified a number of possible systematic errors. Hayes and Latham (1975) made a careful rereduction of the Oke and Schild (1970) and Hayes (1970) Vega observations and included new infrared observations by Hayes, Latham, and Hayes (1975). They confirmed the existence of systematic errors, especially in the treatment of the extinction, and they reduced those errors to produce an improved

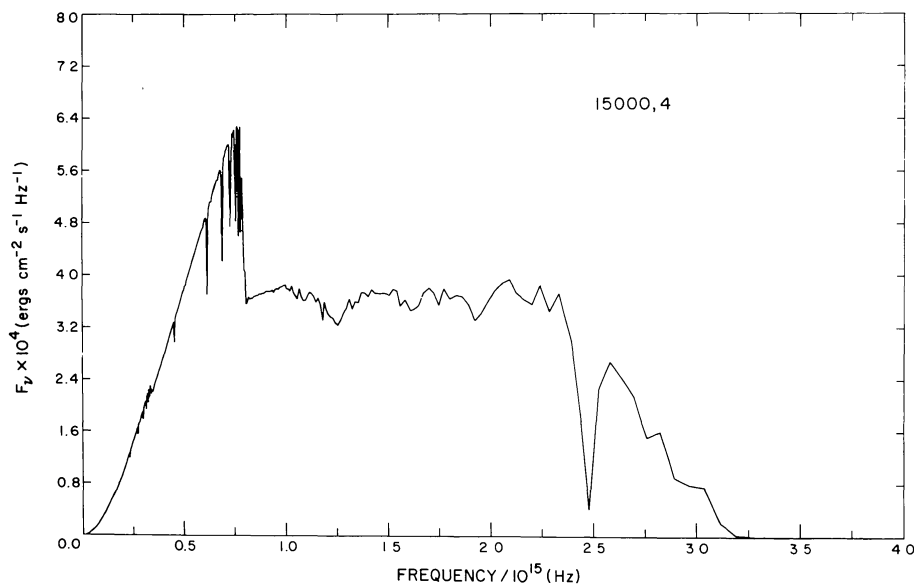


FIG. 12.—Same as Fig. 8 for 15,000, 4

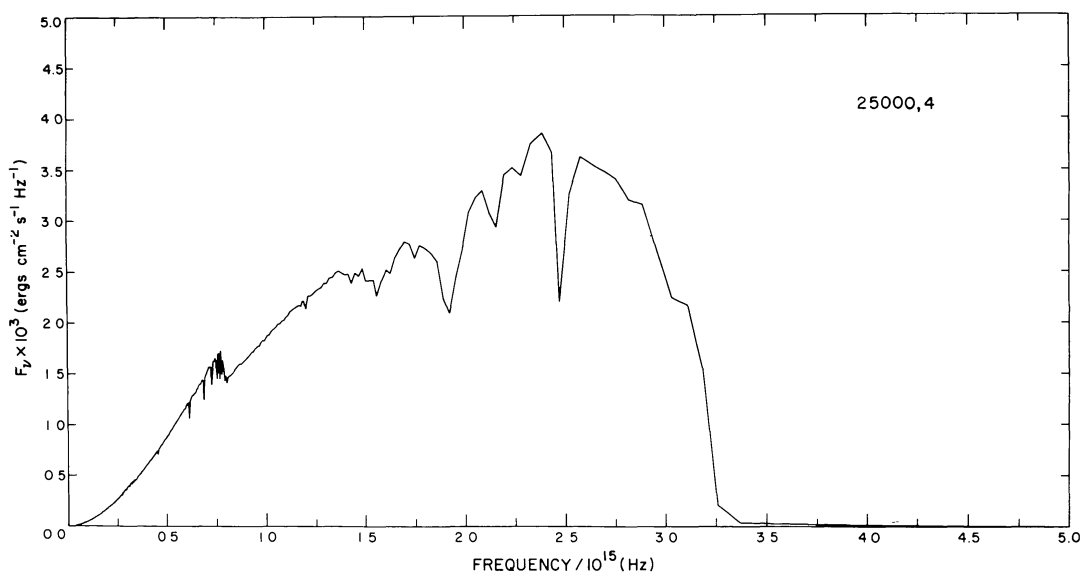


FIG. 13.—Same as Fig. 8 for 25,000, 4

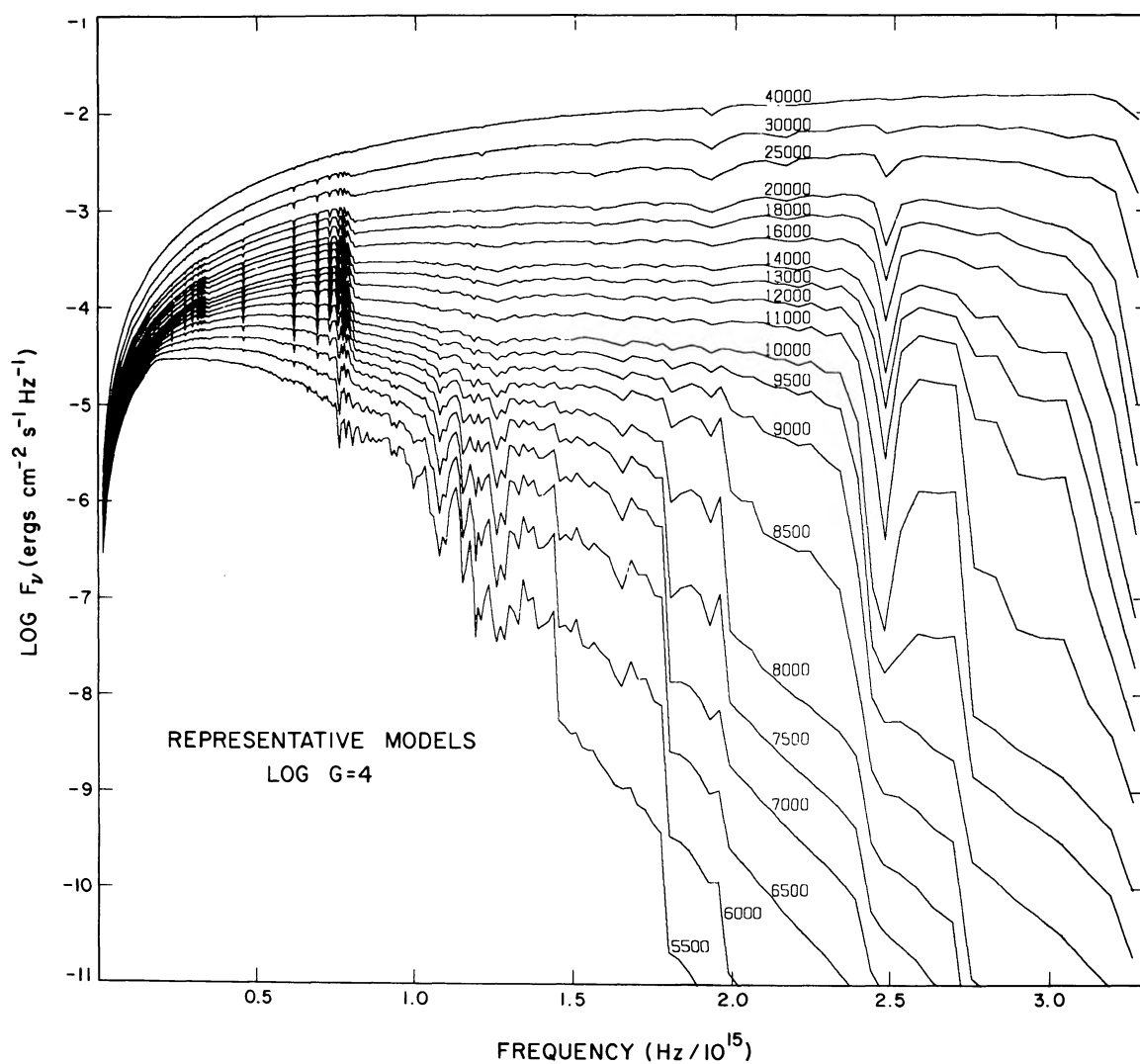


FIG. 14.—The flux F_ν , redward of the Lyman limit as a function of effective temperature for solar abundance models

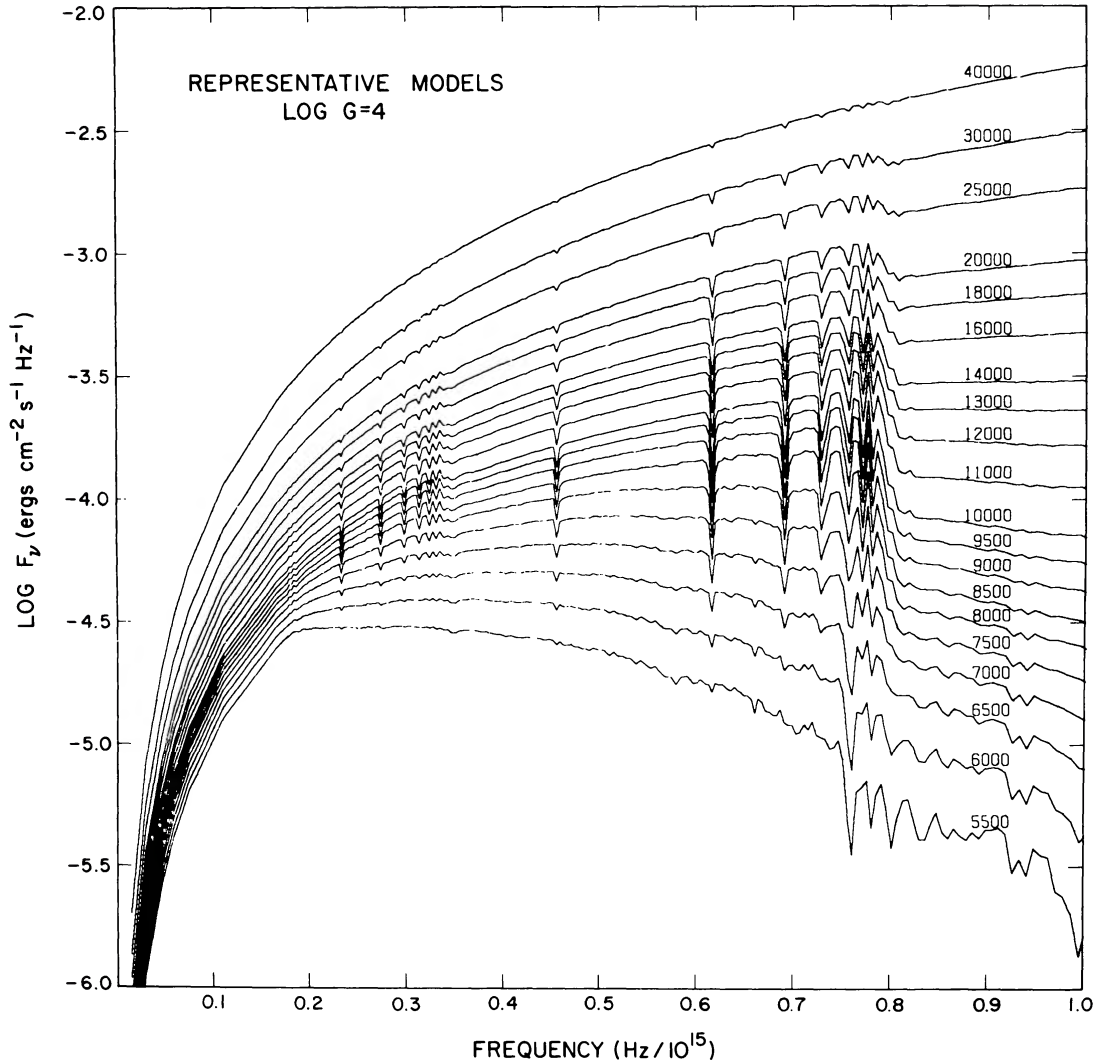


FIG. 15.—The flux F_v visible from the ground as a function of T_{eff}

calibration. We will discuss the comparison of our models to this new calibration in § VI. We obtain an almost perfect match with a $T_{\text{eff}} = 9400$ K, $\log g = 3.95$ model.

Second, the artifact in the model fluxes at the Balmer discontinuity turned out to be a serious error. The hydrogen line opacity in that region arises from the 10 V second level. The Boltzman factor for that level and, consequently, the opacity, are strongly temperature dependent, but the distribution functions for line opacity had not been tabulated with resolution sufficient to treat such a strong temperature dependence. Furthermore, the wavelength resolution across the Balmer discontinuity was such that some computational error would have been introduced in U even if the opacity had been perfect.

Third, the calibration by Matthews and Sandage is seriously out of date. It does not internally reproduce the colors of Vega to 0.05 mag, although Vega was one of their calibrating stars. This is the main contribution

to the KPA error in $B - V$. Matthews and Sandage's method of calibration by computing colors from scanner observations is analogous to our method of computing colors from models (if we used more than one star) and ideally should be more reliable. Unfortunately, the scanner observations available to Matthews and Sandage were normalized to incorrect calibrations of Vega that introduced large errors in U . This constitutes the main contribution to the KPA error in $U - B$. Another problem with scanner observations is that they are usually not scans but discrete observations made at intervals to avoid strong lines, while continuous data are required for the integrations. Also, for Vega, the best observed star, the claimed errors (Hayes and Latham 1975) are large: 2% in the visible and 3% in the ultraviolet. Observations of other stars are known to vary by up to 3 times that value from one observer to another (Breger 1976).

On the basis of the experience of the errors cited above, we tabulated the distribution functions at

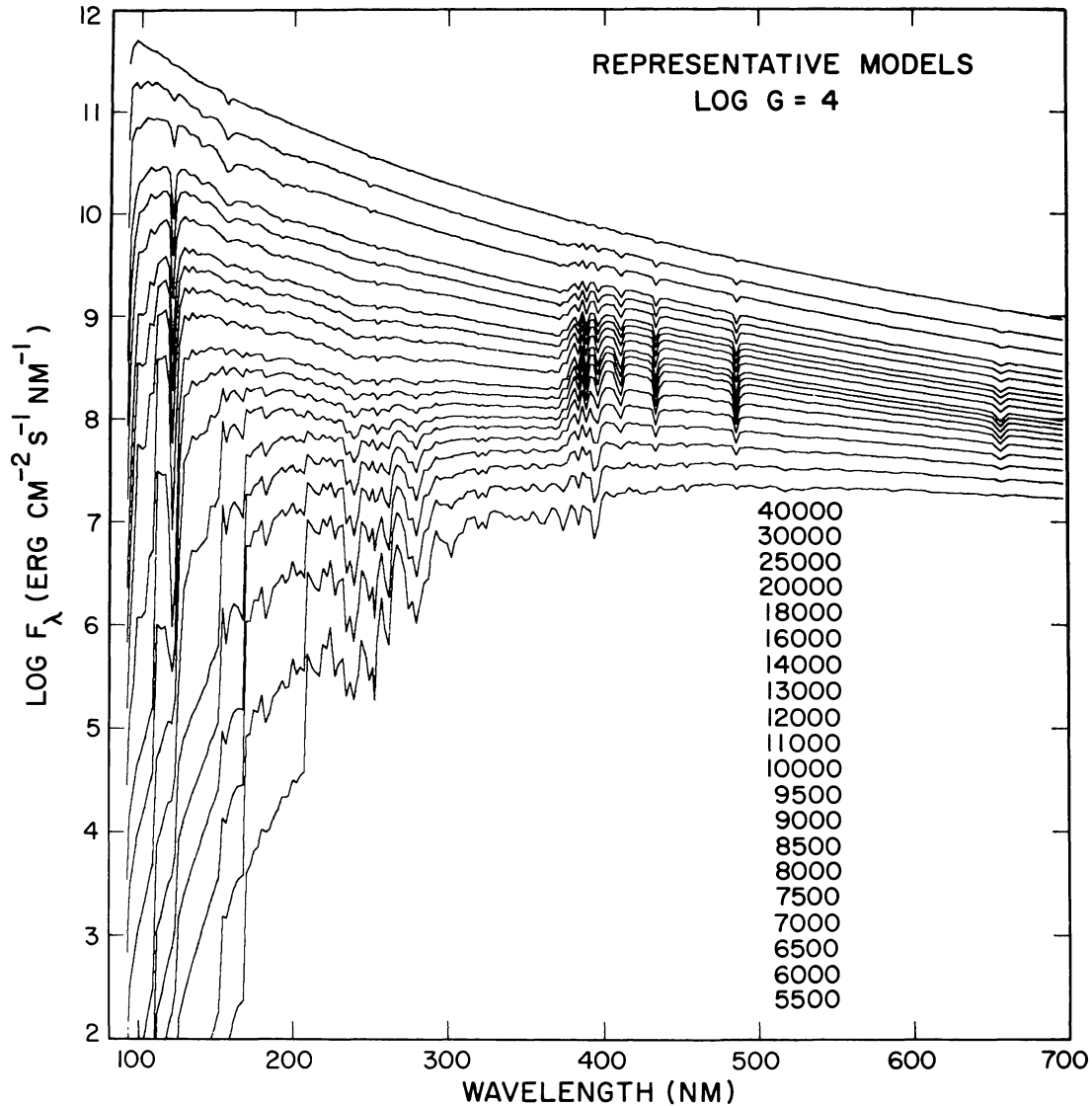


FIG. 16.—The flux F_{λ} redward of the Lyman limit as a function of T_{eff}

much closer spacing in $\log T$ to minimize interpolation errors in the opacity. We computed distribution functions and fluxes using much narrower bandpasses of 2.5 nm in U and B and 5.0 nm in V . Since we were able to compute a model that matches the Hayes and Latham calibration for Vega, we normalized our calculated colors to the observed colors for Vega. We expect the magnitude of systematic errors to be considerably reduced and the wavelength resolution to be adequate for us to compute $uvby$ as well as UBV colors.

There are seven systematic errors in this procedure, which, we hope, are small. (1) The calibration for Vega has errors. (2) The observed colors for Vega have errors and, in fact, have changed over the years (Blanco *et al.* 1970). (3) The theoretical photometric systems may be so unrealistic that they cannot be transformed to the “real” systems by simple constant

shifts. There may be color terms that can be determined only by comparing to many stars. The theoretical systems may be completely unphysical. (4) The numerical integration of the colors has errors. Ideally, the spectrum for each model should be calculated in detail. (5) There may be numerical problems remaining with the distribution functions or with the model atmosphere program itself. (6) The model parameters may be wrong; the microturbulent velocity or abundances may not be correct for the real stars. (7) The model physics may be wrong. The opacities might not be accurate, the convective treatment could be wrong, etc. Since we have not included molecular line opacity, we know that there must be some error in G stars. Relyea and Kurucz (1978) discuss the theoretical $uvby$ photometry in detail and compare to observations to test for such systematic errors. Other tests are described in § IV.

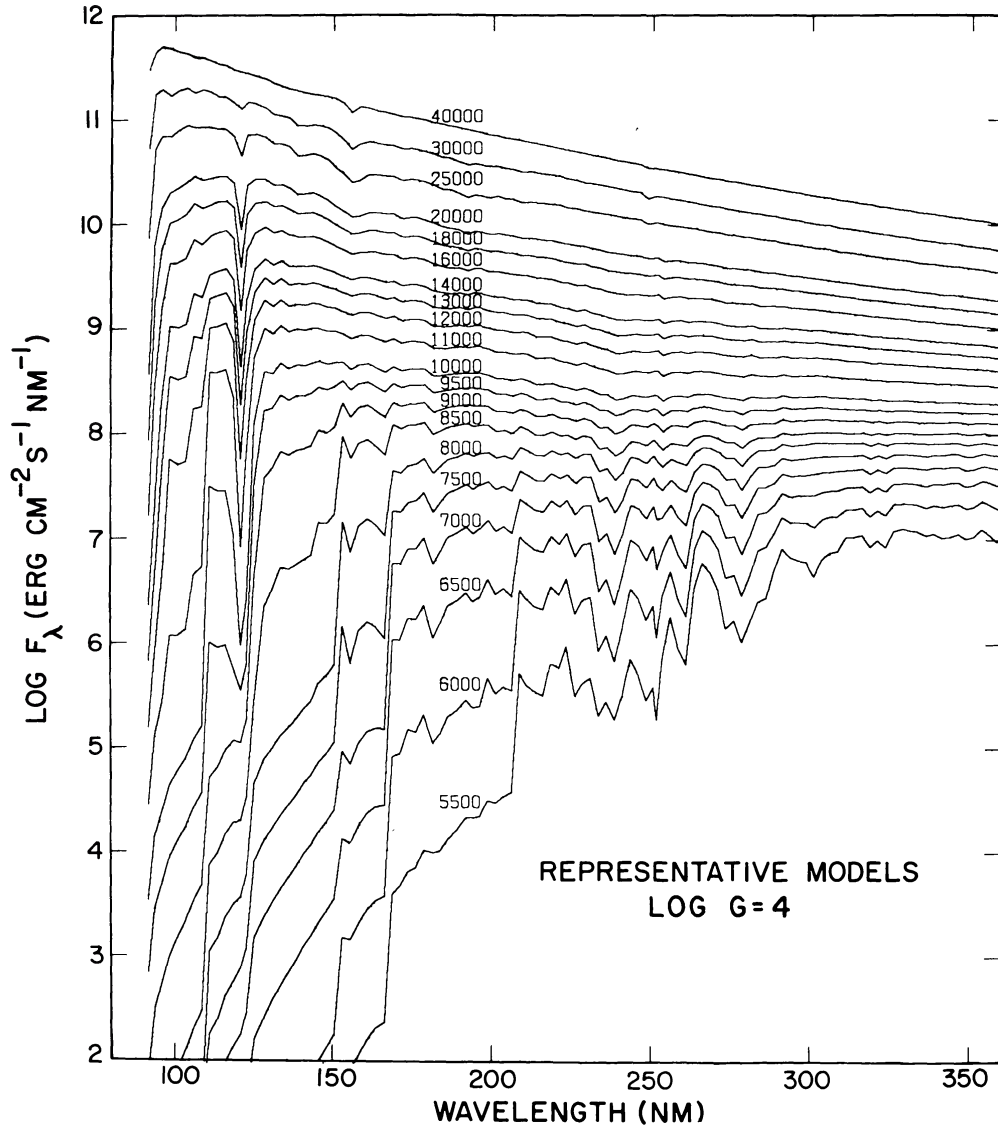


FIG. 17.—The ultraviolet flux F_λ observable from satellites as a function of T_{eff}

c) *UBV*

UBV colors are computed by following Matthews and Sandage, then normalizing to Vega. Since the *U* transmission function is defined at short wavelengths by the atmospheric cutoff, it is not defined for 0 air mass. Matthews and Sandage tabulated *UBV* transmission functions that include filters, a 1P21 photomultiplier, and two aluminum reflections at 1 and 2 air masses, which reduce the colors to 0 air mass. They also define *B* and *V* at 0 air mass. Their transformation equations, including their calibration, are

$$(B - V)_0 = 1.024(B - V)_1 + 0.91 \quad (26)$$

and

$$(U - B)_0 = 0.921(U - B)_1 - 1.308, \quad (27)$$

where the subscripts refer to the air mass. In practice, we compute the integrals

$$X = -2.5 \log \left[\frac{\int S_x(\lambda) F_\lambda d\lambda}{\int S_x(\lambda) d\lambda} \right], \quad (28)$$

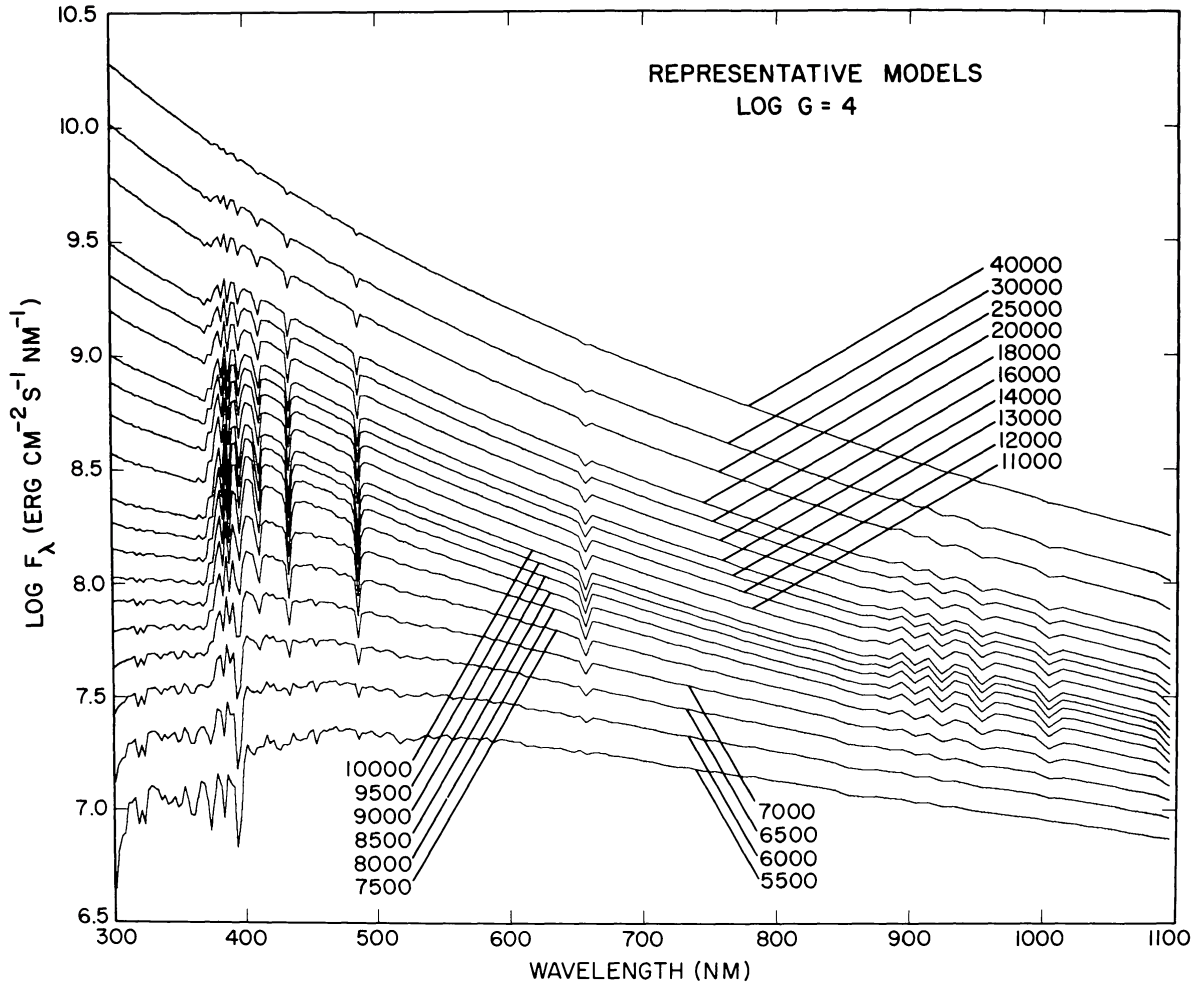
where $S_x(\lambda)$ is the transmission function for passband *X*, by interpolating $S_x(\lambda)$ parabolically and F_λ linearly to a wavelength spacing of 0.1 nm, then trapezoidally integrating. We compute U_1 , U_2 , B_0 , B_1 , V_0 , and V_1 and define

$$U_0 = 2U_1 - U_2, \quad (29)$$

$$(U - B)_1 = U_1 - B_1, \quad (30)$$

and

$$(B - V)_1 = B_1 - V_1. \quad (31)$$

FIG. 18.—The visible flux as a function of T_{eff}

U_0 , B_0 , and V_0 are the mean fluxes in the U , B , and V passbands, although U_0 is only approximate. To match the colors of Vega ($U - B = -0.01$ mag and $B - V = 0.00$ mag), we normalize

$$U - B = (U - B)_0 - 0.020 \quad (32)$$

and

$$B - V = (B - V)_0 + 0.022. \quad (33)$$

In Table 5A, U_0 , B_0 , V_0 , $U - B$, and $B - V$ are listed for each model.

Important note.—Relyea and Kurucz (1978) find systematic errors in our UBV colors. Buser (1978) has empirically modified the UBV filter transmissions using the work of Azusienis and Straižys (1969) as a starting point. Buser and Kurucz (1978) have subsequently recomputed the UBV colors using the Buser filter transmissions instead of the Matthews and Sandage filter transmissions and find much better agreement with observations. In Table 5B we reproduce the improved colors from the Buser and Kurucz paper.

d) Bolometric Corrections

Only a fraction of a star's luminosity is visible through a V filter photometric system,

$$L_v/L = \frac{4\pi R_*^2 \pi \int CS_V(\lambda) F_\lambda d\lambda}{4\pi R_*^2 \pi \int F_\lambda d\lambda}, \quad (34)$$

where C is the absolute normalization of the V measurement system. If we define a bolometric magnitude as a measure of the stellar luminosity,

$$M_{\text{bol}} = -2.5 \log L + \text{constant}, \quad (35)$$

the difference between the bolometric magnitude and the V magnitude is the bolometric correction

$$\text{B.C.} = M_{\text{bol}} - V + \text{constant}. \quad (36)$$

By adjusting the constant, we define the smallest correction to be 0 and all other corrections to be negative, so that a bolometric magnitude is always

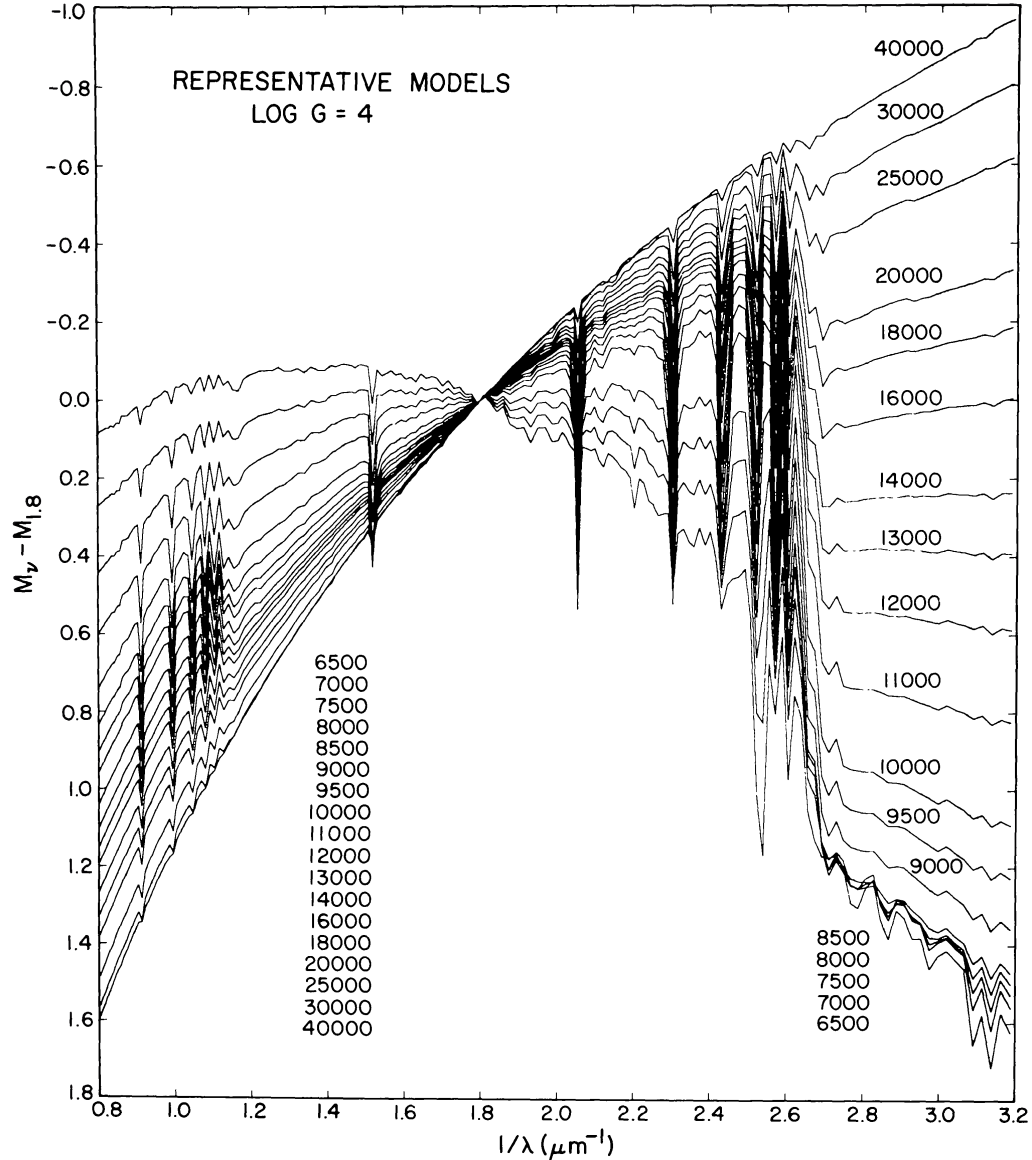


FIG. 19.—The visible colors, $M_V - M_{1.8}$, as a function of T_{eff} . This type of figure can be used to determine T_{eff} from spectrophotometry (cf. Fig. 26). Since $1.8 \mu\text{m}^{-1}$ is the approximate frequency of the V filter, approximate changes of $M_V - V$ with T_{eff} can be read off for any magnitude M_V .

brighter than a V magnitude. From equation (34) we see that

$$\text{B.C.} = -2.5 \log F + 2.5 \log \int CS_V(\lambda) F_\lambda d\lambda + \text{constant}, \quad (37)$$

or, removing the coefficient C and normalizing the V magnitude,

$$\text{B.C.} = -2.5 \log F + 2.5 \log \left[\frac{\int S_V(\lambda) F_\lambda d\lambda}{\int S_V(\lambda) d\lambda} \right] + \text{constant}'. \quad (38)$$

We define

$$\text{B.C.} = \text{BOL} - V + \text{constant}', \quad (39)$$

where

$$\text{BOL} = -2.5 \log F = -2.5 \log (\sigma T_{\text{eff}}^4 / \pi). \quad (40)$$

BOL and V are listed in Table 5B for each model. The smallest value of $\text{BOL} - V$ is -6.986 at $T_{\text{eff}} = 7000$ K, $\log g = 1$, so the bolometric correction is

$$\text{B.C.} = \text{BOL} - V + 6.986. \quad (41)$$

Other normalizations of the bolometric correction are possible, such as a constant for the bolometric correction of the Sun. As discussed in § VI, our model for

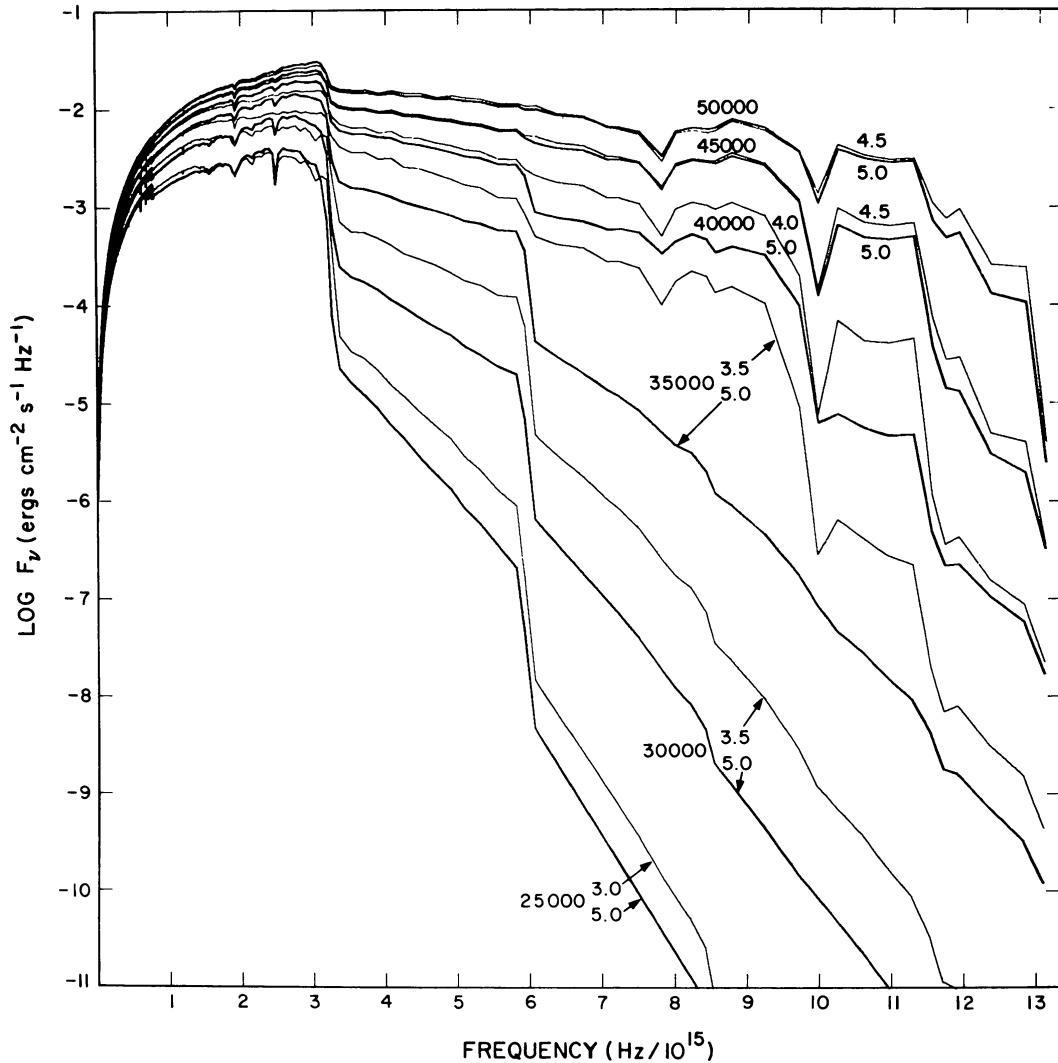


FIG. 20.—Flux F_ν for representative hotter models showing the Lyman and He I continua as a function of T_{eff} for the extremes of gravity calculated in this grid.

the Sun has approximately a 2% error in V , so the $T_{\text{eff}} = 5770$ K, $\log g = 4.44$ model cannot be used simply for defining such a bolometric correction. Further, the V magnitude for the Sun is not well known. To obtain a crude estimate, we can define

$$V_\odot = V_{5770} - 0.02, \quad (42)$$

$$\text{B.C.}_\odot = \text{B.C.}_{5770} + 0.02 = -0.194, \quad (43)$$

so that for a system where $\text{B.C.}'_\odot = -0.07$,

$$\text{B.C.}' = \text{B.C.} + 0.124. \quad (44)$$

A systematic error in the V magnitude for the $T_{\text{eff}} = 7000$ K, $\log g = 1$ model will, of course, introduce an error in the bolometric correction.

e) *uvby*

Intermediate-band *uvby* colors were calculated including the effects of atmospheric transmission in a

manner similar to that of Matthews and Sandage. We used Matsushima's (1969) filter transmission curves, a standard 1P21 photomultiplier sensitivity curve obtained from Tapia (1974) and listed in Table 7, atmospheric transmission (Allen 1973), and the reflectivity of aluminum (Allen 1973). The wavelength dependence in the reflectivity of fresh aluminum is too small to affect the *uvby* colors significantly. In real systems aluminum is dirty and has a time-dependent wavelength dependence that can affect u , but we are unable to treat such effects. We computed *uvby* magnitudes for 0, 1, and 2 air masses. We also determined 0 air-mass magnitudes by reducing the 1 and 2 air-mass magnitudes to 0,

$$x'_0 = 2x_1 - x_2, \quad (45)$$

analogous to the manner by which real observations are reduced. Atmospheric effects are negligible, except in u where the difference between u_0 and u'_0 varies from 0.020 to 0.024 mag. We adopt u'_0 as a better

TABLE 7
1P21 PHOTOMULTIPLIER SENSITIVITY

λ	S	λ	S
300.....	0.08	460.....	0.83
310.....	0.22	470.....	0.77
320.....	0.45	480.....	0.71
330.....	0.68	490.....	0.65
340.....	0.81	500.....	0.58
350.....	0.90	510.....	0.52
360.....	0.95	520.....	0.46
370.....	0.97	530.....	0.40
380.....	0.99	540.....	0.34
390.....	1.00	550.....	0.29
400.....	1.00	560.....	0.24
410.....	0.99	570.....	0.20
420.....	0.98	580.....	0.16
430.....	0.95	590.....	0.13
440.....	0.91	600.....	0.10
450.....	0.87		

value than u_0 even though the variation of 0.004 mag is only marginally significant. In Table 5 we list u'_0 , v_0 , b_0 , and y_0 , the mean fluxes in the filter passbands. The colors are computed from these magnitudes:

$$(u - b)_0 = u'_0 - b_0, \quad (46)$$

$$(b - y)_0 = b_0 - y_0, \quad (47)$$

$$(m_1)_0 = (v_0 - b_0) - (b_0 - y_0), \quad (48)$$

$$(c_1)_0 = (u'_0 - v_0) - (v_0 - b_0). \quad (49)$$

These colors were normalized to the observed colors of Vega (Crawford and Barnes 1970), $u - b = 1.411$, $b - y = 0.004$, $m_1 = 0.157$, and $c_1 = 1.089$, by using the normalizations

$$u - b = (u - b)_0 + 0.759, \quad (50)$$

$$b - y = (b - y)_0 + 0.479, \quad (51)$$

$$m_1 = (m_1)_0 - 0.055, \quad (52)$$

$$c_1 = (c_1)_0 - 0.090; \quad (53)$$

these colors are given in Table 5A.

As discussed in § VI, Relyea and Kurucz (1978) analyze *wby* photometry using these calculated colors.

f) Balmer Line Profiles

Balmer line profiles computed with a program written by Peterson (1975) using the Vidal, Cooper, and Smith (1973) theory are presented in Table 8 (see pages 31 and 312). Figures 21–25 show examples of the variation with temperature and gravity that make the Balmer lines useful for determining gravities for early-type stars and temperatures for later types. We will discuss the comparison of these profiles to observations of Vega in § VI.

VI. COMPARISON TO OBSERVATIONS

The models presented here are reliable if they can predict the photospheric spectrum and energy distribution for stars that can be well observed. To test

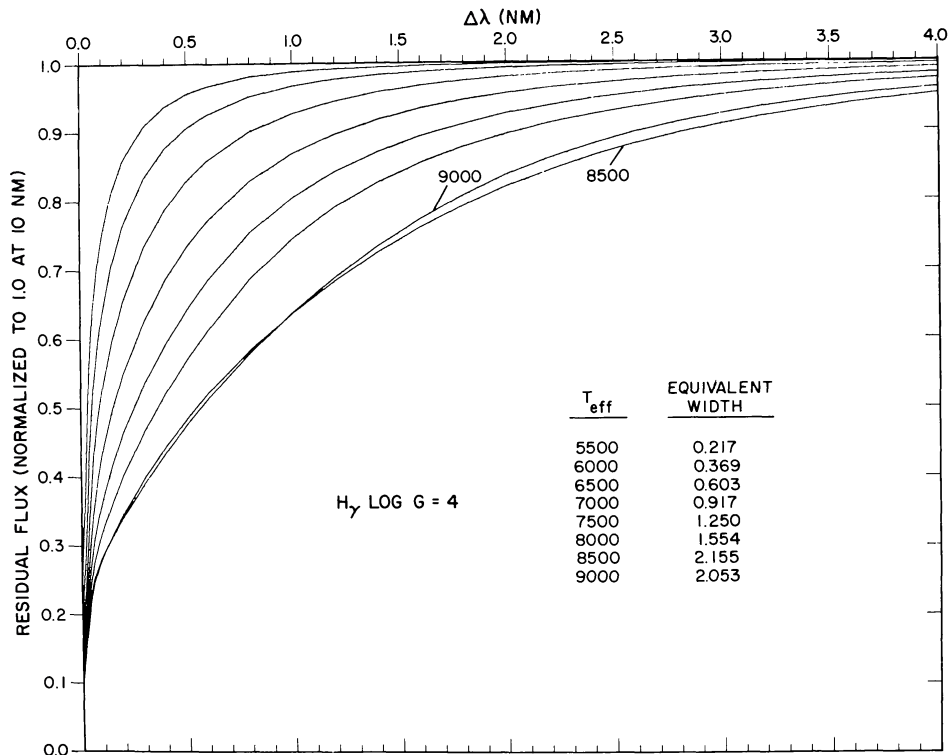


FIG. 21.— H_γ profiles for solar abundance models with $T_{\text{eff}} \leq 9000$ K. Equivalent widths are given in nm.

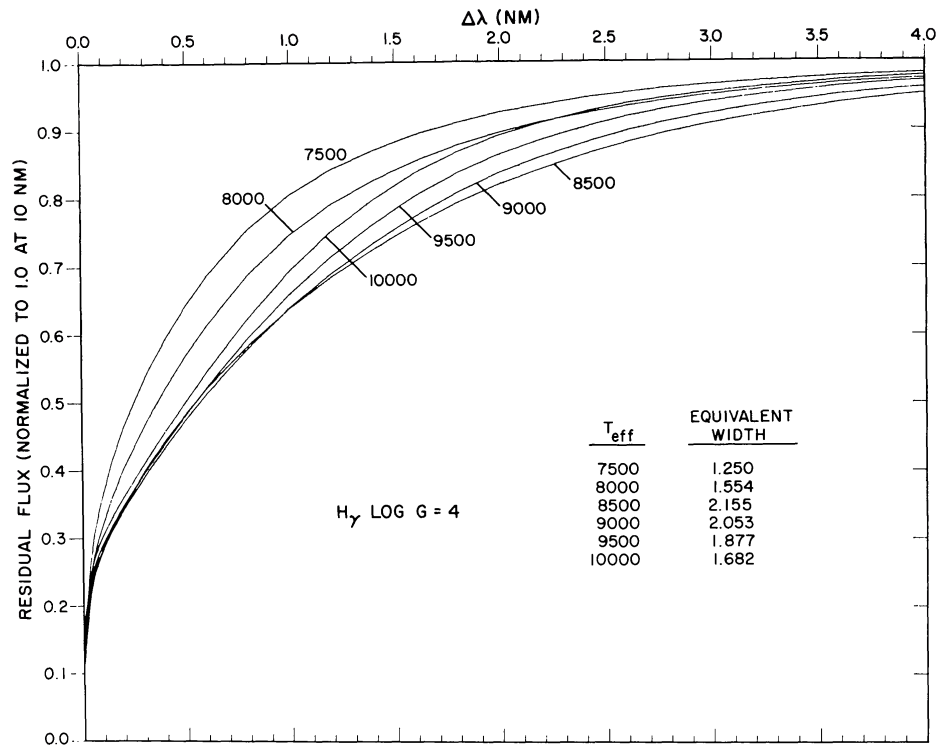


FIG. 22.— H_γ profiles for A star models showing the increase to maximum equivalent width

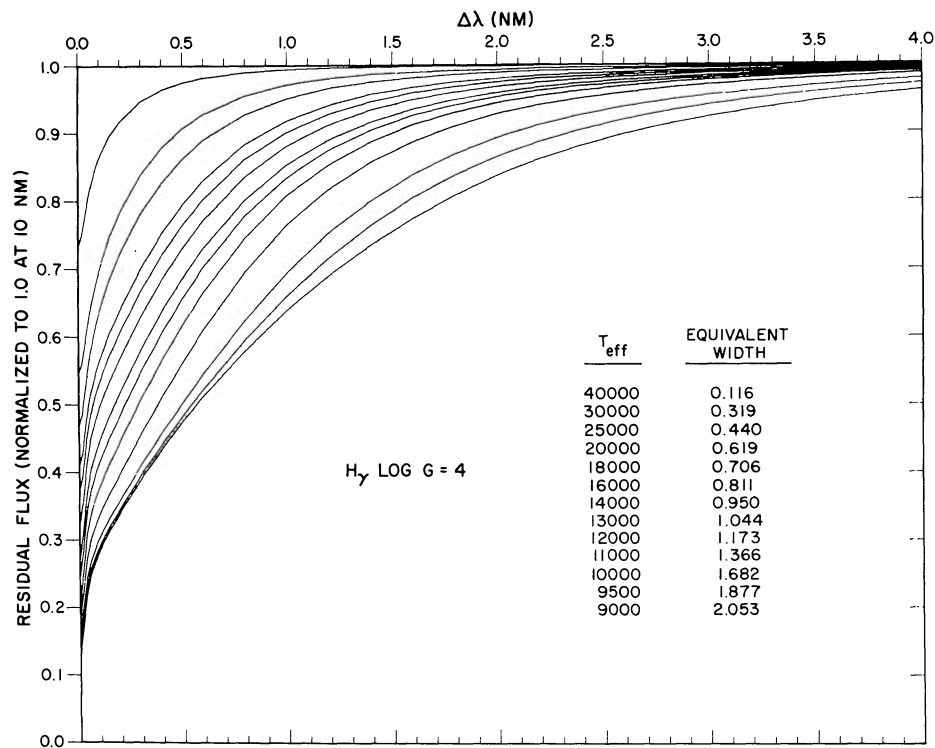


FIG. 23.— H_γ profiles for the early-type models showing the decrease in equivalent width with increasing T_{eff}

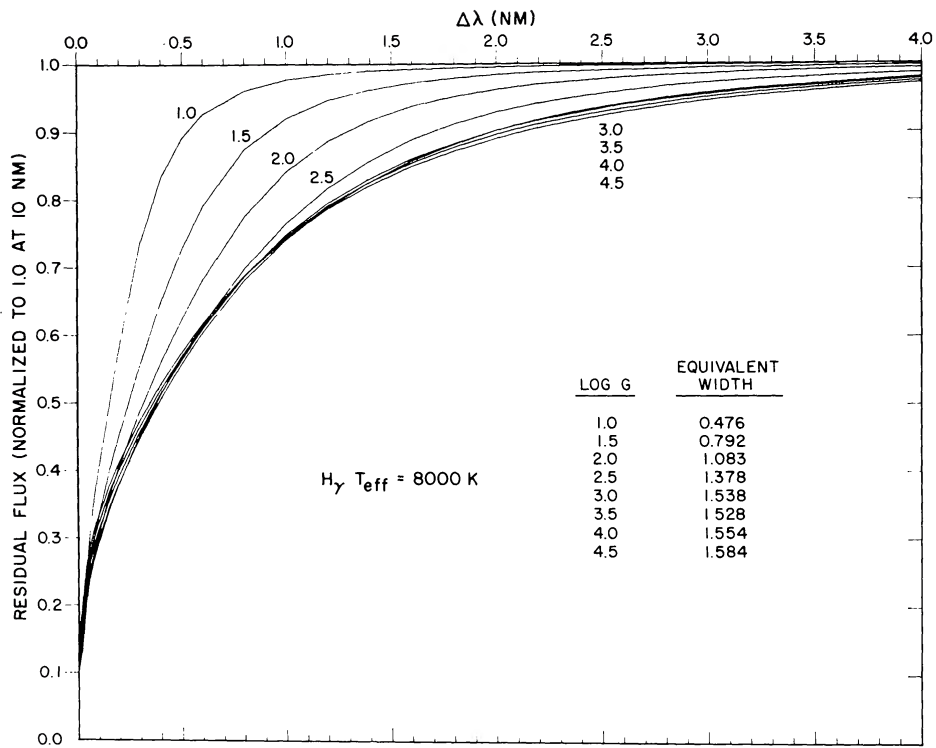
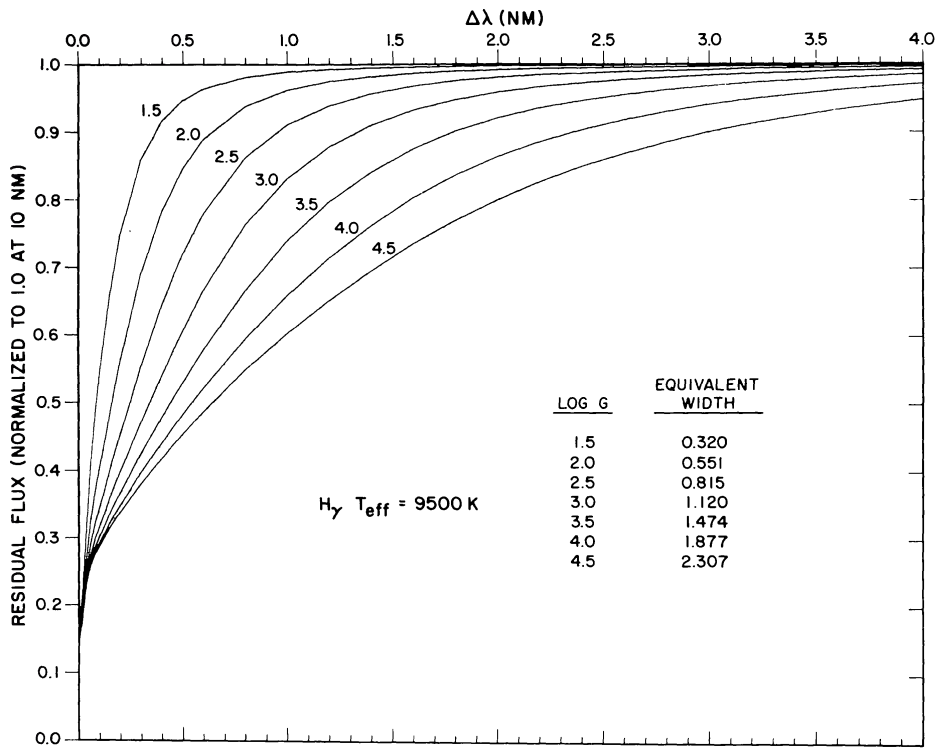


FIG. 24.— H_γ profiles as a function of gravity for $T_{\text{eff}} = 8000 \text{ K}$



— H_γ profiles as a function of gravity for $T_{\text{eff}} = 9500 \text{ K}$, roughly A0, where the profile is ideal for gravity determination

FIG. 25.

the models and the completeness of our line opacity, we have projects under way for synthesizing the spectra of bright stars, starting with the Sun and Vega. That work is proceeding slowly because of difficulties in obtaining the high-resolution spectral atlases and because of the large amount of computer time required.

At lower resolution we can compare Balmer line profiles and energy distributions. We will discuss those comparisons in this section.

At still lower resolution we can compare to colors, as discussed in a paper by Relyea and Kurucz (1978) on the theoretical analysis of *wby* photometry. They find excellent agreement between theoretical *wby* colors predicted from these models and the observations for effective temperatures above 8000 K. For the late A and F stars there is a small systematic error in the colors that may be caused by an inadequate treatment of convection (these stars are weakly convective) or some other reason. Detailed spectral comparisons for models with various treatments of convection, microturbulence, etc., will be required in order to resolve the problem. The colors for the G star models are slightly affected by the lack of molecules in our calculation. The errors do not seem to affect greatly the use of the *wby* colors differentially.

Relyea and Kurucz find that *UBV* colors (Table 5A) are systematically in error because the *U* filter cannot be adequately defined theoretically. Empirical corrections must be made to the theoretical colors if they are to be used. Relyea and Kurucz did not investigate further because the *wby* colors are much more useful for testing the models and for determining stellar parameters.

Buser and Kurucz (1978) have subsequently re-computed the *UBV* colors (Table 5B) using empirically modified filter transmissions (Buser 1978). They find the same effects for *UBV* that Relyea and Kurucz found for *wby*, agreement with observation for effective temperatures above 8000 K, and a small systematic error for cooler stars.

We now turn to the intermediate-resolution comparisons. Vega is the star with the best known energy distribution and is used as the fundamental spectrophotometric standard. The recent revised calibration of its colors by Hayes and Latham (1975), shown in Figure 26, claims accuracies of 2% in the visible and infrared and 3% in the ultraviolet. Balmer line profiles, shown in Figure 27, have been observed by Peterson (1969), who claims an accuracy of 1½%. We have computer programs that plot the colors of any model in the grid together with observed colors (cf. Figs. 19 and 26), and a similar program for Balmer line profiles (cf. Figs. 25 and 27). From the colors we determine the theoretical parameters $T_{\text{eff}} = 9400 \pm 200$ K and $\log g = 4.0 \pm 0.5$. Then from the Balmer lines we find $\log g = 3.95 \pm 0.05$. A model was computed with these parameters and is included in this grid. Figure 26 shows the remarkably good fit to the colors. We note that the slopes of the Brackett, Paschen, and Balmer continua are consistent with the observations as are the colors relative to $1.8 \mu\text{m}^{-1}$, except perhaps between the Balmer lines. Figure 27 shows the excellent Balmer line fit for $H\alpha$, $H\beta$, and $H\gamma$. There is a small discrepancy in that the Balmer line cores are narrower than those observed. However, Vega has a projected rotational velocity of approximately 25 km s^{-1} . Rotationally broadening the theoretical profile would widen

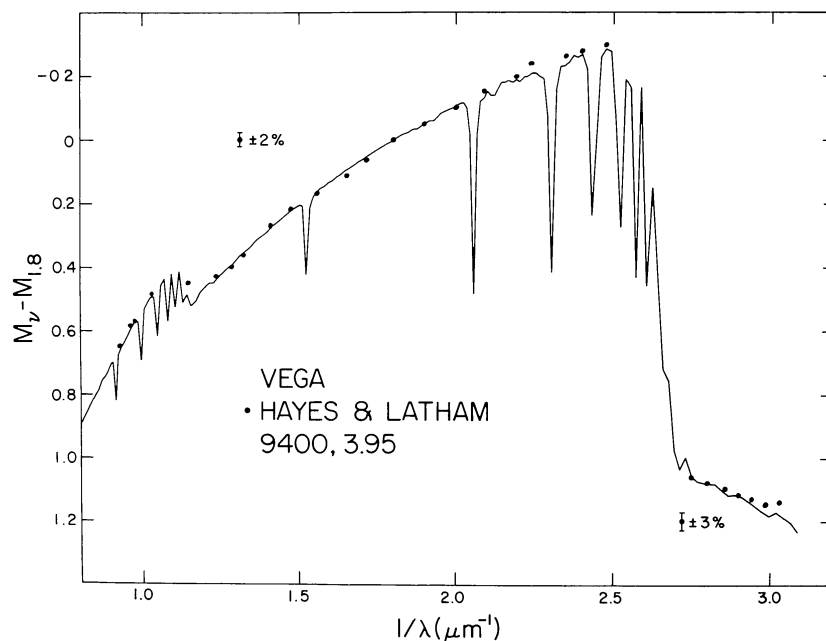


FIG. 26.—Comparison of the colors of the 9400, 3.95 model with the recalibration of Vega by Hayes and Latham (1975). Error bars for the observations are indicated.

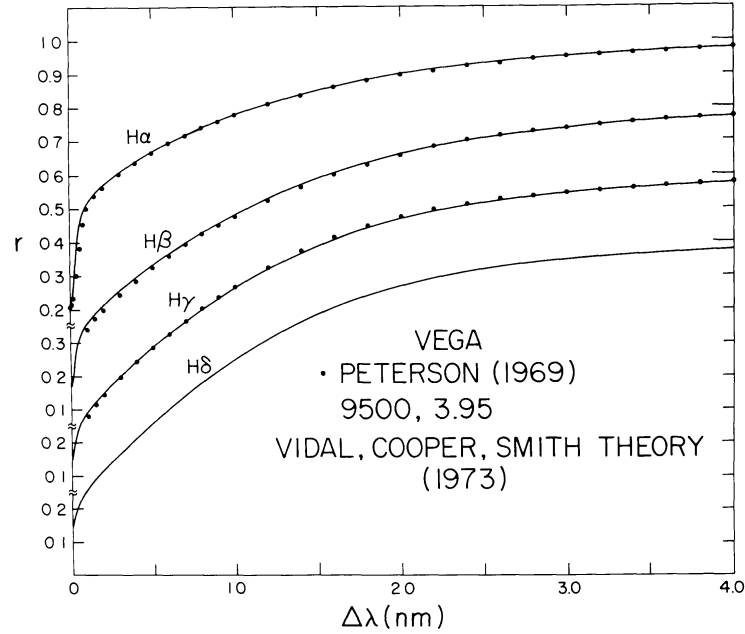


FIG. 27.—Balmer line profiles for the model shown in Fig. 26 compared to the observations of Peterson (1969)

the core to match the observations without noticeably affecting the wings. The central residual intensity would then be too high, but non-LTE effects, which have not been included, would lower the central depth of the lines (Peterson 1969). Thus we conclude that our model calculation is in excellent agreement with the intermediate-resolution observations of Vega.

Tüg, White, and Lockwood (1977) have remeasured the energy distribution of Vega, and their colors agree with those of Hayes and Latham. Figure 28 shows the excellent agreement of our Vega model with their

observations. The difference at the Paschen limit arises because their narrow bandpass resolves higher-series lines.

Our effective temperature of 9400 K is consistent with an earlier value of 9650 K found by Schild, Peterson, and Oke (1971) using models that included only hydrogen lines. Since the new models have more opacity, they should produce approximately the same colors at a lower effective temperature. Our parameters are also consistent with the empirical values determined by Code *et al.* (1976) and Code (1975) of

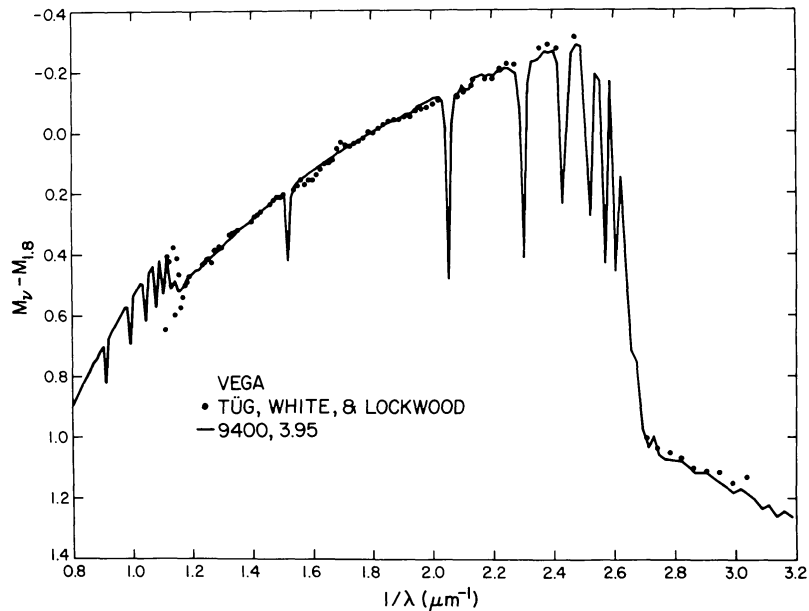


FIG. 28.—Comparison of the colors of the 9400, 3.95 model with the calibration of Vega by Tüg, White, and Lockwood (1977)

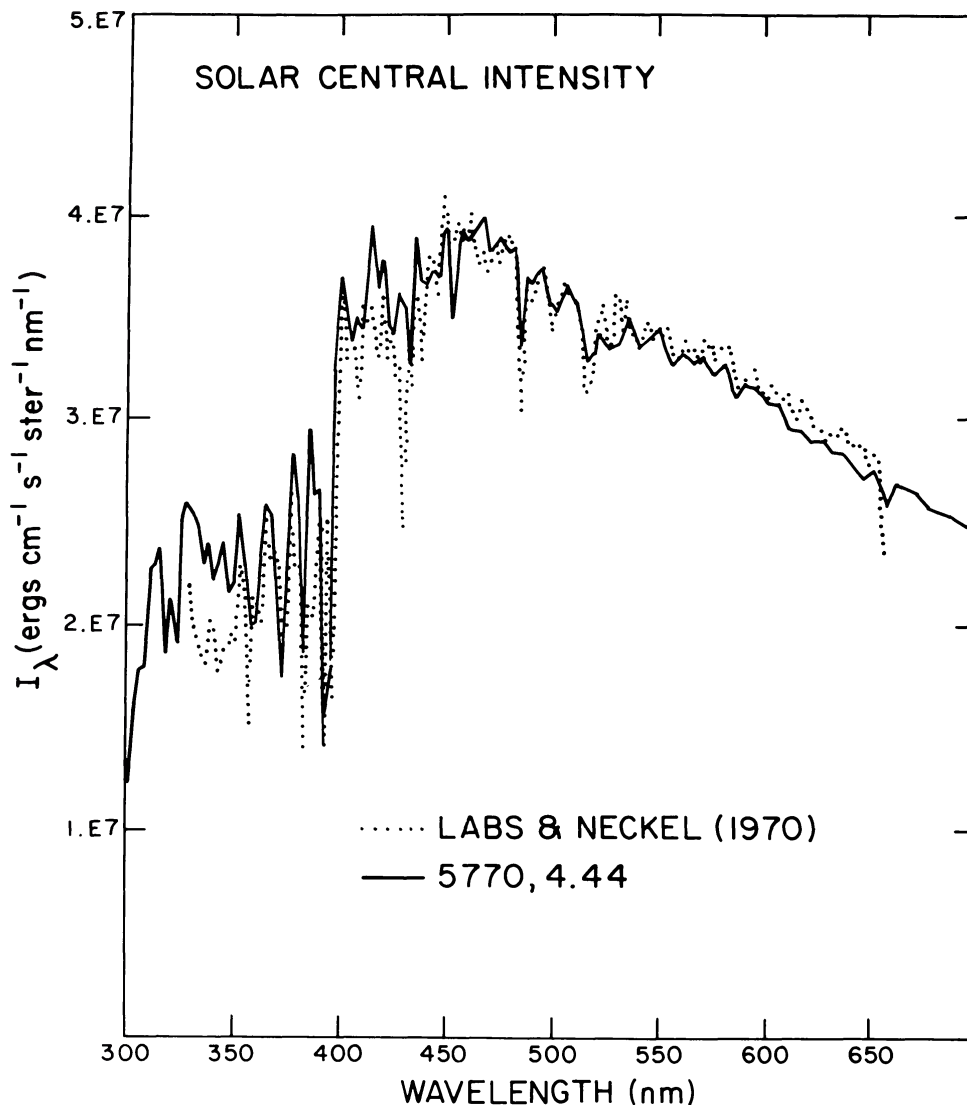


FIG. 29.—Solar central intensity computed from the 5770, 4.44 model compared to the observations of Labs and Neckel (1970)

9660 ± 140 K and 3.94 ± 0.08 , respectively, in the sense that the error limits overlap.

Observations to similar accuracy have also been made by Labs and Neckel (1968, 1970) for the solar central intensity. We computed a model with $T_{\text{eff}} = 5770$ K, $\log g = 4.44$ and predicted the central intensity for comparison to their observations as shown in Figure 29. Since molecular lines are not included, the G band at 430 nm is too weak and the calculated intensity at 340 nm is too high. In our opinion, the low intensity in the red is consistent with not enough opacity in the model from molecules. As discussed in § I, this comparison indicates just the small discrepancies that we would expect from our limited line data.

Lower-accuracy rocket and satellite observations of Vega and the Sun are also available. In Figure 30 we show the flux at the Earth observed by the *OAO 2*

satellite (Code and Meade 1976) and by the *TD 1* satellite (Jamar *et al.* 1976) together with our model for Vega normalized at 310 nm. The correspondence is generally good in the features above 190 nm. The dip at 240 nm is caused by Fe II resonance lines that may be too strong. The overall level seems to be slightly less than the *TD 1* measurements. If those measurements are correct, the model must be very close to correct. If the *OAO 2* measurements are correct, the model has a significant overestimate of the line opacity between 130 and 200 nm that would result in a slight underestimate of the effective temperature.

In Figure 31 we show a solar rocket flux measurement by Broadfoot (1972) plotted with our predicted solar flux at the solar surface. The model is generally higher in the ultraviolet as expected because molecular opacity is not included. The computations of Fe II lines around 240 nm are too strong, which probably results

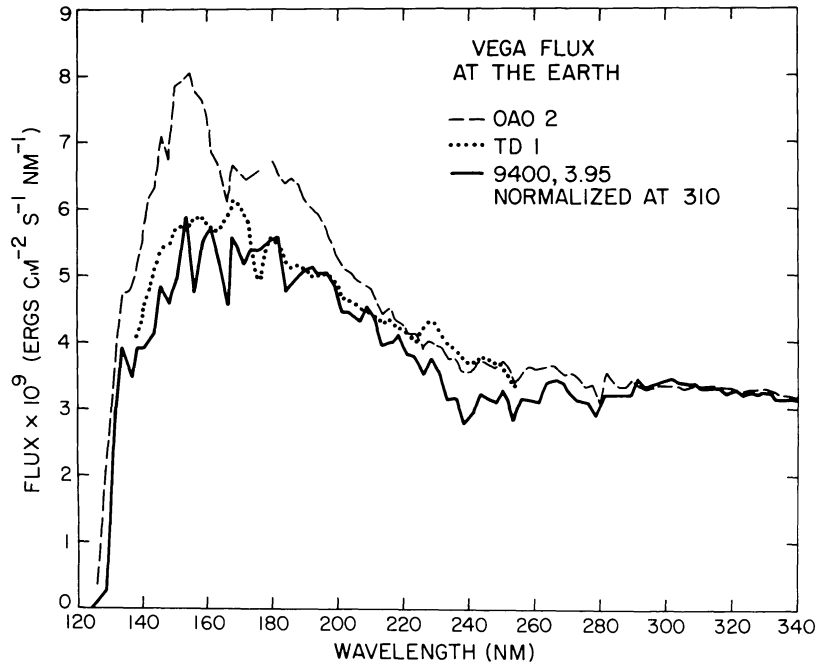


FIG. 30.—Observed ultraviolet flux from Vega at the top of the atmosphere compared with our model for Vega. The *OAO 2* measurements are from Code and Meade (1976). The *TD 1* measurements are from Jamar *et al.* (1976).

from overestimated damping constants. As mentioned above, we are making detailed spectral comparisons to investigate the discrepancies.

Comparisons should be made between our predicted fluxes and all the normal stars in the *OAO 2*, *TD 1*, and Breger (1976) spectrophotometric catalogs, but we have not yet done so.

VII. COMPARISON WITH OTHER GRIDS OF MODELS

In this section we compare our results with other large-scale grids of models that have attempted to include all the line opacity and that overlap our temperature range. These include the grids of Carbon and Gingerich (1969); Peytremann (1970, 1974*a, b*);

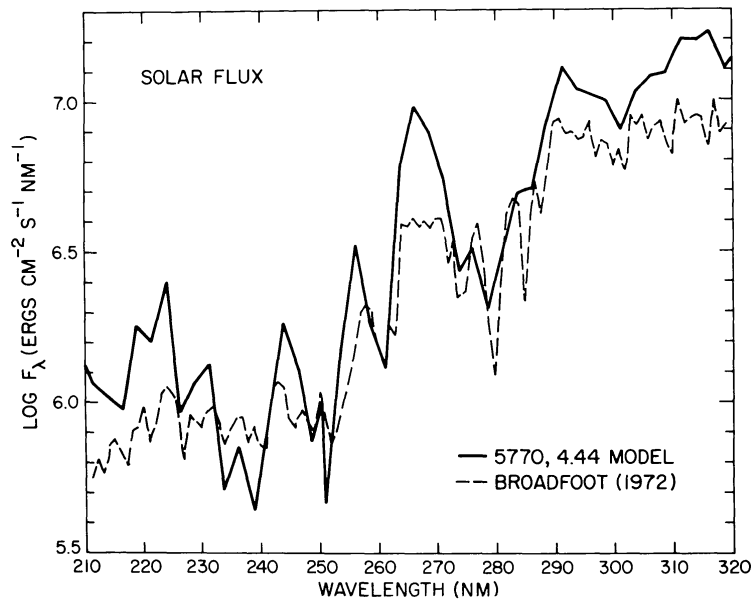


FIG. 31.—Flux F_ν for our solar model compared to the ultraviolet flux observations by Broadfoot (1972). Broadfoot tabulates N_λ (photons $\text{s}^{-1} \text{cm}^{-2} \text{\AA}^{-1}$), and the conversion is F_ν (ergs $\text{cm}^{-2} \text{s}^{-1} \text{nm}^{-1}$) = $10^{12} N_\lambda h\nu (d/R_\odot)^2 / \pi = 2.9210 \times 10^8 N_\lambda / \lambda$ for λ in \AA and $d = 1 \text{ AU}$.

Gustafsson *et al.* (1975) and Bell *et al.* (1976, both hereafter GBEN); and KPA. We also compare our results with the widely referenced LTE and non-LTE models of Mihalas (1972), which give an indication of our error in assuming LTE.

The Carbon and Gingerich grid was an early attempt to use a distribution-function representation for the line opacity. They did not have atomic data sufficient to compute the distribution functions but, instead, produced empirical three-step distribution functions by varying the parameters to force a match to the observed visible blocking of a few bright stars. They guessed the ultraviolet opacity. The models labeled "old" in Figures 1, 2, and 3 are Carbon and Gingerich models, while those labeled "new" are ours. Their procedure clearly underestimated the opacity for the earlier-type stars and produced models with too shallow a temperature gradient.

Peytremann computed a grid of models in which he used a sampling technique to evaluate integrals over the radiation field. He chose 600 frequencies and evaluated the line opacity explicitly at each one. However, the line data that were available to him were the same as those used by Strom and Kurucz (1966) in the first attempt at a distribution-function model and were considerably deficient. He therefore introduced pseudolines, similar to the lines he already had, sufficient to produce a reasonable solar model. In Figure 32 we show Peytremann's 8500, 2, -1 model (where we use the notation T_{eff} , $\log g$, \log abundance relative to solar to identify a model), which is the

hottest model in his grid. The agreement is very close, generally within 100 K. If we ignore the surface drop, the higher temperature in our model indicates slightly more opacity. We hypothesize that the lower surface temperature in the Peytremann model is caused by having too much opacity in line cores that become optically thin at $\log \tau_{500} = -2.5$. This could arise because his pseudolines were given the same properties as the lines for which data existed, but those lines are the stronger lines through selection effects. In fact, the missing lines would tend to be weaker and not contribute so much "core" opacity. Alternatively, his frequencies might accidentally fall on too many line cores. Figure 33 shows the comparison of our solar models, but the comparison is complicated by the increased convection in our model. Our interpretation is that in this model also we have slightly more opacity.

KPA computed a grid of models for early-type solar abundance stars covering the range from 8000 to 50,000 K using essentially the same data and technique that we use here. The difference is that we have used higher resolution in temperature and wavelength in tabulating the distribution functions because their tabulation was so coarse that it introduced serious interpolation errors in the opacity. This led to an underestimate of the opacity and to models with too shallow a temperature gradient as shown in Figures 34, 35, and 36. Thus effective temperatures derived from the KPA energy distributions should be systematically slightly high.

By use of the KPA distribution functions Kurucz (1974) also computed a solar model that is shown in

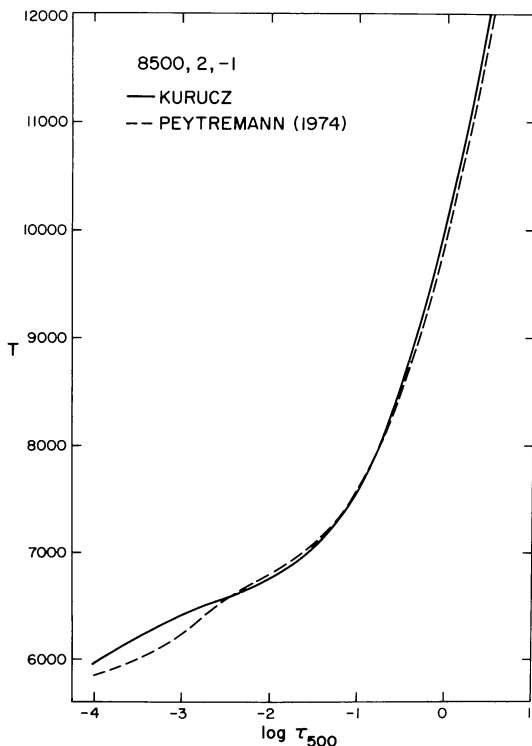


FIG. 32.—Comparison of our 8500, 2, -1 model $T - T_{500}$ relation with that of Peytremann (1972).

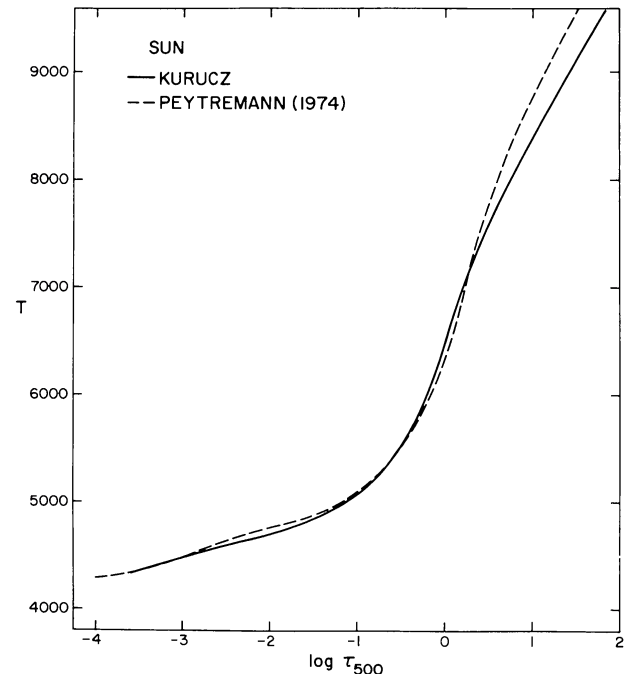


FIG. 33.—Comparison of our solar model with that of Peytremann (1974a, b).

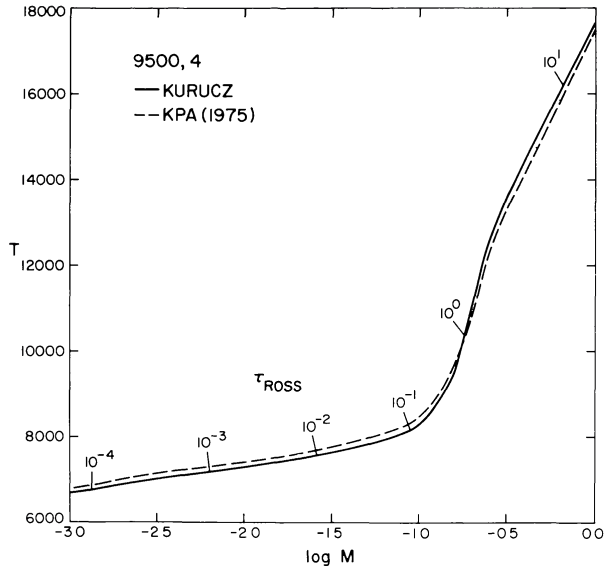


FIG. 34.—Comparison of our 9500, 4 model with that of KPA. Rosseland optical depths are indicated.

Figure 37. The opacity errors produce small temperature differences from our present model, but these are much smaller than the differences from other theoretical models that arise from different treatments of convection and opacity.

We also compare our model with two widely referenced empirical models: the HSRA model by Gingerich *et al.* (1971) and the model by Vernazza, Avrett, and Loeser (1976, hereafter VAL), which are shown in Figure 38. It is likely that mechanical heating, which is not included in our radiative equilibrium

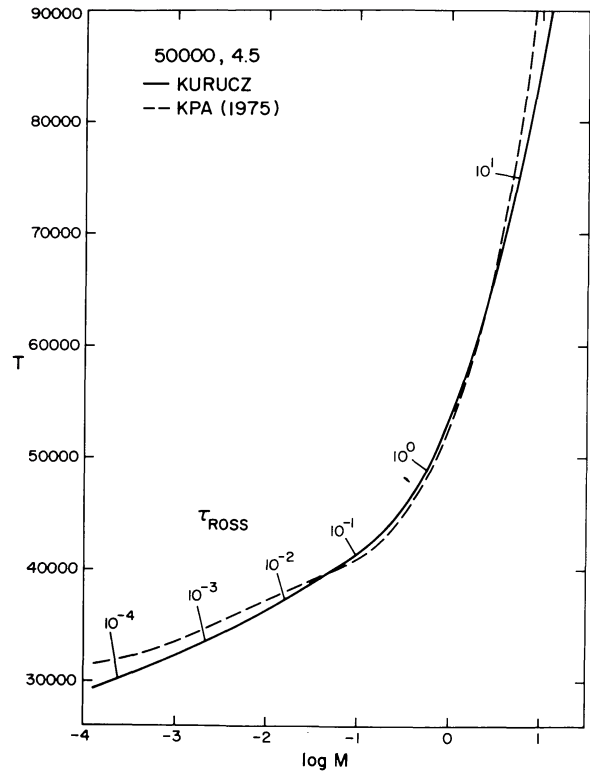


FIG. 36.—Same as Fig. 34 for 50,000, 4.5

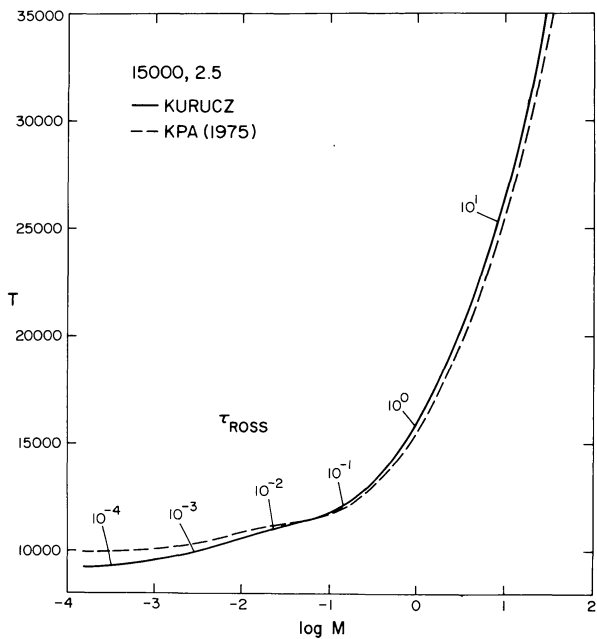


FIG. 35.—Same as Fig. 34 for 15,000, 2.5

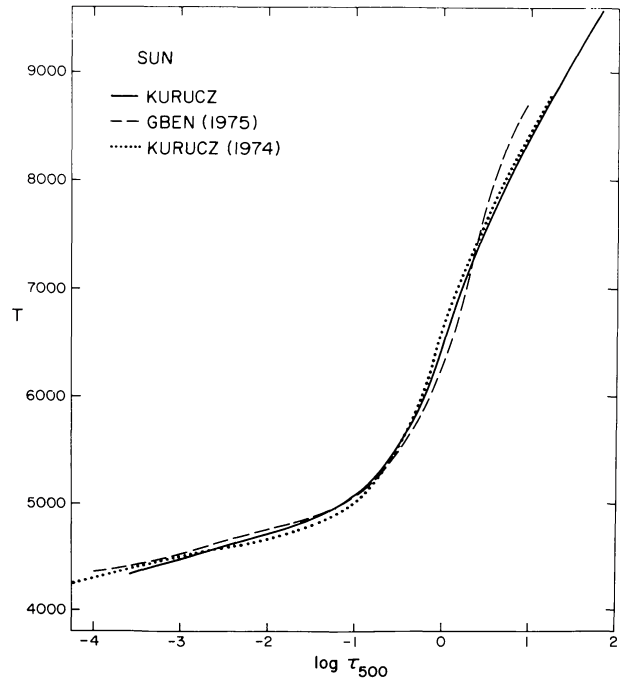


FIG. 37.—Comparison of our solar model with the models of Kurucz (1974) and GBEN.

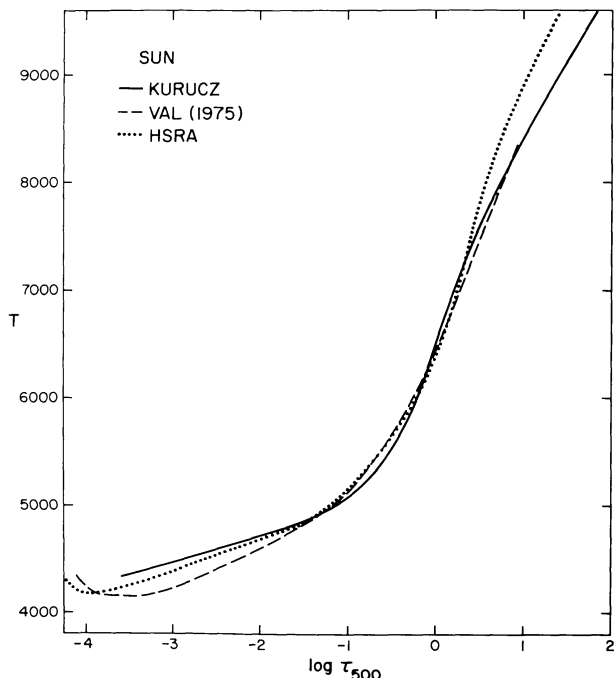


FIG. 38.—Comparison of our solar model with the VAL and HSRA empirical models.

model, would raise the temperature at the temperature minimum as well as in the chromosphere. Thus we expect a realistic radiative equilibrium model to have temperatures in the temperature-minimum region lower than those in a realistic empirical model that necessarily includes the heating. However, our model lies above these empirical models in the temperature-minimum region. As discussed in § V, our solar model has insufficient opacity because it does not include molecules. Thus its temperature gradient is too shallow and its temperature in the temperature-minimum region is too high. Thus part of the discrepancy lies in our model, but it is also possible that these empirical models are incorrect and should be, say, 200 K hotter in the temperature-minimum region.

The GBEN models for later-type stars were computed with a statistical distribution-function representation of the line opacity that is similar to ours. Their line data were determined by empirically fitting the solar spectrum in the visible and from laboratory data, and include both atomic and molecular lines. However, their ultraviolet line data are incomplete. Also, they assume narrower lines, a 2 km s^{-1} total Doppler width, instead of our 2 km s^{-1} microturbulent velocity. When we compare solar abundance models (Figs. 37 and 39), no great difference is apparent, except in the convection zone, $\tau_{500} > 2$, where the difference is due to our various treatments of convection. The agreement at shallow layers indicates that the models have approximately the same total opacity. Our increased ultraviolet atomic opacity and Doppler width apparently balance GBEN's molecular opacity and narrower Doppler width. In Figure 40 we

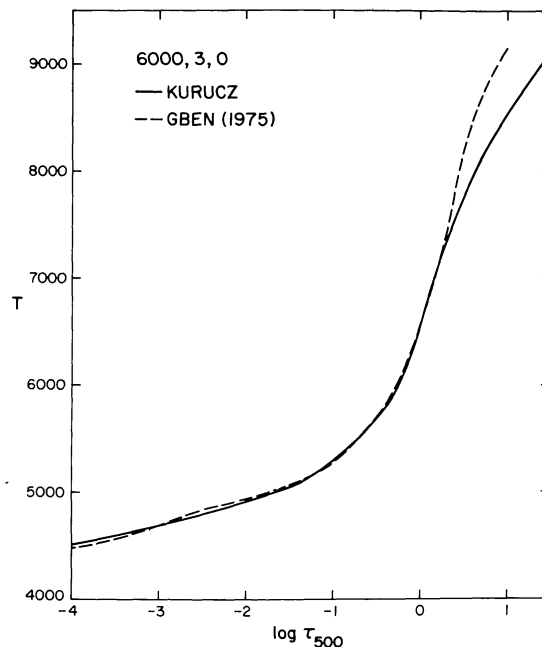


FIG. 39.—Similar to Fig. 37 for 6000, 3, 0

show models for a Population II G giant. In this case our model clearly has more opacity. Improved model calculations and detailed spectrum comparisons will be made to explain the difference.

Mihalas has published grids of models for O and B stars including both LTE and non-LTE calculations. The models do not include metal line opacity. A comparison with two examples that show large differences between LTE and non-LTE models is shown in Figures 41 and 42. The differences between

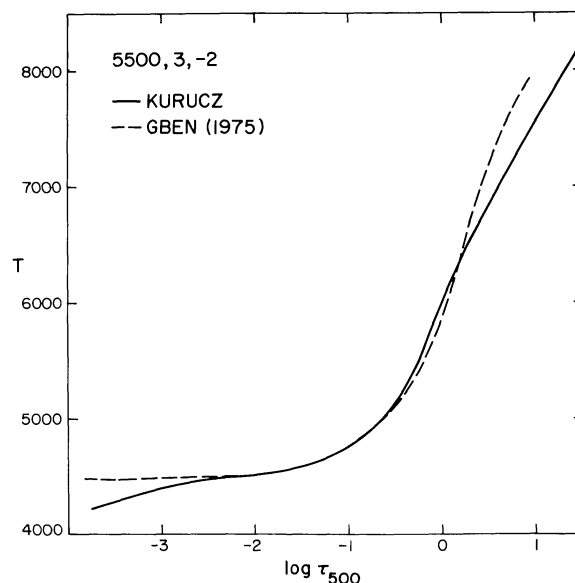


FIG. 40.—Similar to Fig. 37 for 5500, 3, -2

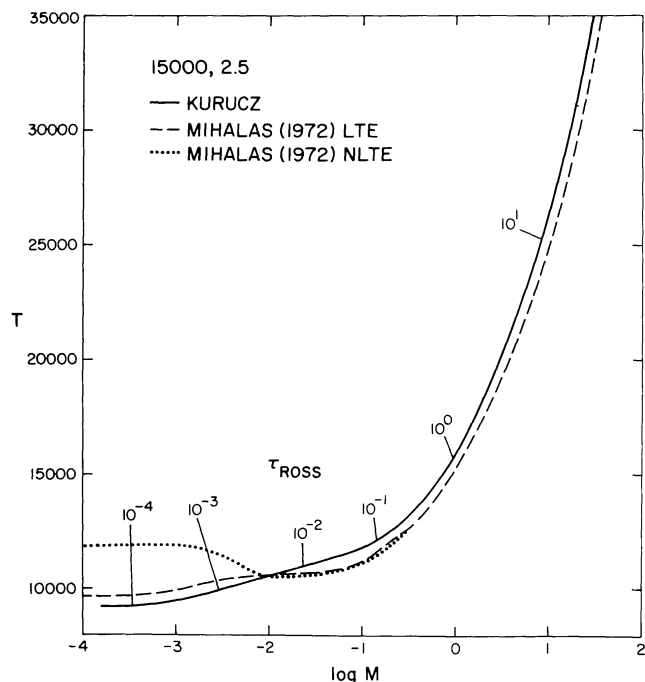


FIG. 41.—Comparison of our 15,000, 2.5 model to LTE and non-LTE models by Mihalas (1972).

the Mihalas LTE and non-LTE models show the magnitude of the errors that might be expected in our hottest and lowest-gravity models because of the LTE approximation. Such errors decrease rapidly as the gravity increases. The reader should note the significant errors in the Mihalas LTE models compared to our model, for $\tau_{\text{ROSS}} > 10^{-2}$, because sufficient line opacity was not included. Thus neither grid of models is accurate, but ours is more reliable at higher gravities for predicting continua and weak lines. A non-LTE calculation that treats all the lines is currently beyond the state of the art, but an approximation where hydrogen and helium are treated in non-LTE with other lines in LTE might be feasible.

These models were computed in 1974, 1975, and 1976 at Kitt Peak National Observatory, the State University of New York at Albany, and the Smithsonian Astrophysical Observatory using the equivalent of 400 hours of CDC 6400 computer time. We are especially grateful to Dr. Lawrence Relyea for providing time at Albany and for the considerable assistance and encouragement he gave to this project. We thank the computer staff at Kitt Peak National Observatory for their help and patience. We thank Dr. Bruce Carney for critical comments on the text.

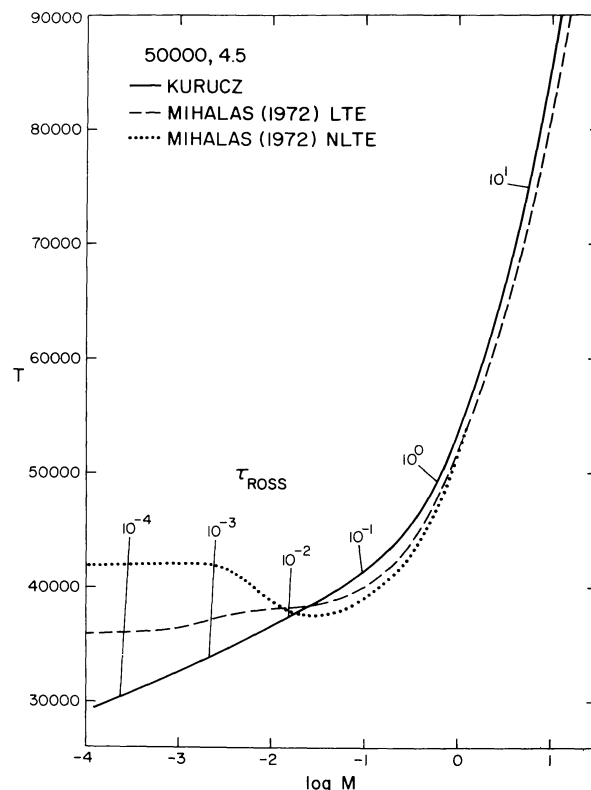


FIG. 42.—Same as Fig. 41 for 50,000, 4.5

Note added in manuscript, 1978 November.—As of this writing, we have available the following additional material:

Tapes of distribution functions for 10, 3, 1/3, 1/30, 1/300, 1/1000, and 0 times solar abundances. We plan to compute grids of models for these abundances as computer time becomes available.

Limb darkening for all the models listed here. With Dr. Brian Flannery we plan to investigate rotation and binary light curves. We are open to collaboration.

Predicted infrared fluxes for Vega and Sirius.

A and B star models for 10 and 3 times solar abundance.

Distribution functions leaving out hydrogen lines. We plan to use these together with accurate $H\beta$ profiles to produce $H\beta$ indices.

Thirteen-color photometry for all the models listed here.

Note added in proof, 1979 March.—We have now computed grids of model atmospheres for 10, 3, 1, 1/3, 1/10, 1/30, 1/100, 1/300, 1/1000, and 0 times solar abundances for the temperature range 5500–8500 K. We also have models for A and B stars for 1/3 and 1/10 times solar abundances.

NOTES TO TABLES 4, 5, 6, AND 8

TABLE 4.—There are 140 solar abundance models, 72 1/10 solar abundance models, and 72 1/100 solar abundance models listed two per page. The heading for each model gives the effective temperature, log surface gravity, log metal abundance relative to solar, and whether the model is convective plus radiative or purely radiative. The 40 depths actually used in the computation are listed, roughly equally spaced in $\log \tau_{\text{Ross}}$ from -4.5 to 2.0 in steps of $\frac{1}{2}$. Owing to scaling from model to model and to radical temperature corrections, this spacing is not always maintained. To compress the tables, all the variables except temperature are given as logs. The units are cgs for all variables. The columns are mass per unit area, Rosseland optical depth, continuum optical depth at 500 nm, geometric height, temperature, pressure, electron number density, atom number density, mass density, Rosseland mass absorption coefficient, continuum mass absorption coefficient at 500 nm, radiation pressure, radiative acceleration, and the fraction of flux carried by convection. The first values of τ_{Ross} , τ_{500} , and x are defined to be 0. Depths with no convection are listed with 0 convection fraction.

TABLE 5.—Predicted colors in the *UBV* and *uvby* systems as described in § Vb are listed for each model. The columns are effective temperature; log surface gravity; log metal abundance relative to solar; mean magnitudes in the *U*, *B*, and *V* passbands, which are equal to -2.5 times the log mean flux F_λ ; the bolometric magnitude, which is -2.5 times the log integrated flux F ; $U - B$; $B - V$; the bolometric correction normalized to 0.0 for 7000, 1; the mean magnitudes in the *u*, *v*, *b*, and *y* passbands; $u - b$; $b - y$; m_1 ; c_1 . Table 5A lists the Matthews and Sandage *UBV*; Table 5B, the preferred Buser and Kurucz *UBV*.

TABLE 6.—Nine models are listed on each page, but four pages are required in order to list the 342 wavelengths for each model. The heading for each column gives the effective temperature, the log surface gravity, and the log metal abundance relative to solar. The first column lists the wavelength in nm. Each model column lists $\log F_\lambda$ (ergs $\text{cm}^{-2} \text{s}^{-1} \text{nm}^{-1}$) and the per mil blocking fraction $(1 - F_\lambda/F_\lambda^{\text{continuum}})$, which indicates the line absorption. Flux was not computed in the Lyman continuum for the coolest models, so the columns for those models are filled out with 0.0000. Below we list the factors by which to multiply our fluxes to convert to other units:

	F_λ (nm^{-1})	1.
	F_λ (\AA^{-1})	0.1
	F_λ (μm^{-1})	1000.
	F_λ (cm^{-1})	10^7
Flux moment	H_λ ($\text{nm}^{-1} \text{sr}^{-1}$)	0.25
Physical flux	\mathcal{F}_λ (nm^{-1})	π
Flux at Earth	f_λ (nm^{-1})	$(R_*/d)^2 \pi = (\theta/2/206264806)^2 \pi$
Photon flux at Earth	N_λ (nm^{-1})	$(R_*/d)^2 \pi / h\nu = 1.58148\text{E}9 \lambda (R_*/d)^2 = 1.58148\text{E}9 \lambda (\theta/2/206264806)^2$
	F_ν (Hz^{-1})	$\lambda/\nu = \lambda^2/c = \lambda^2/2.997925\text{E}17$
	F_ν [$(\text{cm}^{-1})^{-1}$]	$\lambda/(10^7/\lambda) = 10^{-7} \lambda^2$

where λ is in nm, R_* is the stellar radius, d is the stellar distance, and θ is the stellar angular diameter in milli-arcsec.

TABLE 8.— $\text{H}\alpha$, $\text{H}\beta$, $\text{H}\gamma$, and $\text{H}\delta$ line profiles are listed for each model. The table for each line runs for six pages listing all the models. For each model are given the effective temperature, log surface gravity, log metal abundance relative to solar, equivalent width in nm, and 27 values of residual flux in per mil for the wavelength displacements from line center in nm that are listed at the top of each page. A residual flux labeled “000” stands for 1000. The profiles are normalized to 1000 at ± 10 nm from line center. If these profiles are to be compared to observed profiles that are operationally defined relative to some other displacement from line center, the profiles and equivalent widths must be renormalized.

(This Page Intentionally Left Blank)

Table with columns: MASS, TAU ROSS, TAU 500, TEFF, 6000., LOG G, 1.00, LOG ABUND, .00, CONVECTIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-40.

Table with columns: MASS, TAU ROSS, TAU 500, TEFF, 6000., LOG G, 1.50, LOG ABUND, .00, CONVECTIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-40.

Table with 15 columns: MASS, TAU ROSS, TAU 500, TEFF, 7000., LOG G 2.00, LOG ABUND, .00, CONVECTIVE, KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Contains data rows 1 through 40.

Table with 15 columns: MASS, TAU ROSS, TAU 500, TEFF, 7000., LOG G 2.50, LOG ABUND, .00, CONVECTIVE, KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Contains data rows 1 through 40.

Table with 15 columns: MASS, TAU ROSS, TAU 500, TEFF, X, 7500. T, LOG G, P, 4.00, NE, LOG ABUND, NA, .00, RHO, CONVECTIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Contains data for elements 1-40.

Table with 15 columns: MASS, TAU ROSS, TAU 500, TEFF, X, 7500. T, LOG G, P, 4.50, NE, LOG ABUND, NA, .00, RHO, CONVECTIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Contains data for elements 1-40.

Table with columns: MASS, TAU ROSS, TAU 500, TEFF, 8500., LOG G 2.00, LOG ABUND .00, RADIATIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-30, 31-40.

Table with columns: MASS, TAU ROSS, TAU 500, TEFF, 8500., LOG G 2.50, LOG ABUND .00, RADIATIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-30, 31-40.

Table with 17 columns: MASS, TAU ROSS, TAU 500, TEFF X, 9000. T, LOG G P, 4.50 NE, LOG ABUND NA, .00 RHO, RADIATIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-40.

Table with 17 columns: MASS, TAU ROSS, TAU 500, TEFF X, 9400. T, LOG G P, 3.90 NE, LOG ABUND NA, .00 RHO, RADIATIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-40.

Table with columns: MASS, TAU ROSS, TAU 500, TEFF 12000., LOG G 3.50, LOG ABUND .00, RADIATIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-40.

Table with columns: MASS, TAU ROSS, TAU 500, TEFF 12000., LOG G 4.00, LOG ABUND .00, RADIATIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-40.

Table with 16 columns: MASS, TAU ROSS, TAU 500, X, TEFF 17000., T, LOG G, P, NE, NA, LOG ABUND, .00, RHO, RADIATIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONVERSION FRAC. Rows 1-40.

Table with 16 columns: MASS, TAU ROSS, TAU 500, X, TEFF 17000., T, LOG G, P, NE, NA, LOG ABUND, .00, RHO, RADIATIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONVERSION FRAC. Rows 1-40.

Table with 15 columns: MASS, TAU ROSS, TAU 500, X, T, P, NE, NA, RHO, CONVECTIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-40.

Table with 15 columns: MASS, TAU ROSS, TAU 500, X, T, P, NE, NA, RHO, CONVECTIVE KAPPA ROSS, KAPPA 500, P RAD, ACC RAD, CONV FRAC. Rows 1-40.

TABLE 5
COLORS AND BOLOMETRIC CORRECTIONS

A.

TEFF	LOG G	LOG A	U	B	V	BO _L	U-B	B-V	BC	U	V	B	Y	U-B	B-Y	M1	C1
5500	0.00	0.00	-17.065	-18.234	-18.376	-25.545	.523	.742	-.165	-16.747	-18.089	-18.411	-18.394	2.423	.463	.282	.931
5500	.450	0.00	-17.172	-18.247	-18.364	-25.545	.442	.718	-.177	-16.907	-18.122	-18.411	-18.382	2.262	.450	.263	.836
5500	1.00	0.00	-17.280	-18.257	-18.351	-25.545	.360	.695	-.190	-17.065	-18.150	-18.409	-18.369	2.103	.439	.244	.735
5500	1.50	0.00	-17.376	-18.262	-18.337	-25.545	.284	.678	-.204	-17.204	-18.168	-18.404	-18.356	1.959	.430	.230	.637
5500	2.00	0.00	-17.472	-18.266	-18.326	-25.545	.208	.663	-.215	-17.340	-18.184	-18.399	-18.344	1.818	.424	.215	.539
5500	2.50	0.00	-17.540	-18.258	-18.309	-25.545	.146	.654	-.232	-17.441	-18.183	-18.386	-18.327	1.704	.420	.207	.449
5500	3.00	0.00	-17.596	-18.240	-18.306	-25.545	.105	.649	-.235	-17.524	-18.188	-18.388	-18.324	1.623	.415	.208	.376
5500	3.50	0.00	-17.622	-18.252	-18.298	-25.545	.082	.650	-.243	-17.572	-18.179	-18.385	-18.316	1.572	.411	.219	.311
5500	4.00	0.00	-17.628	-18.245	-18.295	-25.545	.077	.654	-.246	-17.599	-18.167	-18.388	-18.312	1.548	.407	.234	.264
5500	4.50	0.00	-17.617	-18.238	-18.294	-25.545	.087	.659	-.247	-17.599	-18.153	-18.384	-18.312	1.548	.403	.254	.231
5770	4.44	0.00	-18.049	-18.563	-18.458	-25.753	-.019	.589	-.4201	-18.021	-18.515	-18.677	-18.569	1.415	.371	.214	.243
6000	.50	0.00	-17.915	-18.923	-18.850	-25.923	.358	.529	-.069	-17.559	-18.896	-19.020	-18.875	2.221	.334	.214	1.123
6000	1.00	0.00	-17.979	-18.912	-18.835	-25.923	.298	.526	-.084	-17.684	-18.890	-19.003	-18.859	2.078	.335	.202	1.002
6000	1.50	0.00	-18.059	-18.902	-18.820	-25.923	.225	.521	-.099	-17.823	-18.885	-18.968	-18.844	1.922	.337	.188	.871
6000	2.00	0.00	-18.134	-18.888	-18.804	-25.923	.154	.520	-.115	-17.949	-18.875	-18.968	-18.828	1.777	.339	.178	.743
6000	2.50	0.00	-18.200	-18.869	-18.786	-25.923	.086	.521	-.133	-18.060	-18.858	-18.947	-18.810	1.645	.342	.172	.618
6000	3.00	0.00	-18.262	-18.854	-18.772	-25.923	.024	.522	-.147	-18.160	-18.841	-18.931	-18.795	1.530	.343	.170	.503
6000	3.50	0.00	-18.310	-18.837	-18.759	-25.923	-.027	.522	-.160	-18.238	-18.823	-18.916	-18.782	1.438	.345	.173	.402
6000	4.00	0.00	-18.344	-18.823	-18.750	-25.923	-.063	.531	-.169	-18.295	-18.805	-18.906	-18.773	1.370	.345	.180	.319
6000	4.50	0.00	-18.362	-18.811	-18.744	-25.923	-.083	.538	-.175	-18.331	-18.788	-18.901	-18.768	1.330	.345	.192	.255
6500	1.00	0.00	-18.543	-19.483	-19.247	-26.270	.287	.368	-.019	-18.162	-19.531	-19.515	-19.277	2.112	.440	.167	1.296
6500	1.50	0.00	-18.584	-19.457	-19.233	-26.270	.232	.379	-.033	-18.273	-19.503	-19.490	-19.262	1.976	.450	.161	1.152
6500	2.00	0.00	-18.634	-19.428	-19.214	-26.270	.172	.390	-.052	-18.387	-19.471	-19.462	-19.242	1.834	.459	.157	1.001
6500	2.50	0.00	-18.695	-19.401	-19.176	-26.270	.103	.409	-.070	-18.504	-19.442	-19.436	-19.224	1.690	.467	.151	.853
6500	3.00	0.00	-18.759	-19.373	-19.177	-26.270	.030	.438	-.089	-18.618	-19.410	-19.409	-19.205	1.550	.474	.149	.702
6500	3.50	0.00	-18.822	-19.345	-19.159	-26.270	-.042	.419	-.107	-18.722	-19.377	-19.384	-19.186	1.421	.481	.149	.559
6500	4.00	0.00	-18.878	-19.320	-19.143	-26.270	-.107	.428	-.123	-18.810	-19.347	-19.362	-19.170	1.311	.487	.152	.432
6500	4.50	0.00	-18.921	-19.298	-19.131	-26.270	-.157	.438	-.135	-18.877	-19.320	-19.346	-19.158	1.228	.492	.158	.357
7000	1.00	0.00	-19.033	-19.997	-19.458	-26.592	.280	.196	.000	-18.557	-20.118	-19.962	-19.621	2.163	.138	.129	1.628
7000	1.50	0.00	-19.034	-19.945	-19.585	-26.592	.247	.245	-.003	-18.653	-20.045	-19.928	-19.618	2.034	.169	.138	1.419
7000	2.00	0.00	-19.061	-19.907	-19.573	-26.592	.201	.270	-.015	-18.754	-19.997	-19.900	-19.605	1.905	.184	.143	1.250
7000	2.50	0.00	-19.103	-19.869	-19.554	-26.592	.141	.290	-.034	-18.863	-19.950	-19.867	-19.586	1.763	.198	.142	1.081
7000	3.00	0.00	-19.157	-19.831	-19.534	-26.592	.071	.308	-.054	-18.975	-19.905	-19.834	-19.585	1.618	.210	.143	.912
7000	3.50	0.00	-19.218	-19.793	-19.512	-26.592	-.006	.324	-.076	-19.086	-19.862	-19.801	-19.543	1.474	.221	.143	.746
7000	4.00	0.00	-19.282	-19.758	-19.492	-26.592	-.085	.339	-.096	-19.191	-19.820	-19.771	-19.522	1.339	.231	.144	.588
7000	4.50	0.00	-19.342	-19.725	-19.472	-26.592	-.160	.353	-.116	-19.283	-19.780	-19.742	-19.502	1.218	.239	.148	.444
7500	1.00	0.00	-19.501	-20.401	-19.880	-26.892	.211	.083	-.008	-18.982	-20.560	-20.318	-19.915	2.095	.075	.107	1.731
7500	1.50	0.00	-19.466	-20.388	-19.876	-26.892	.238	.093	-.012	-19.016	-20.545	-20.313	-19.911	2.056	.077	.115	1.671
7500	2.00	0.00	-19.451	-20.348	-19.869	-26.892	.229	.127	-.019	-19.087	-20.493	-20.288	-19.904	1.960	.095	.124	1.521
7500	2.50	0.00	-19.469	-20.289	-19.864	-26.892	.176	.180	-.024	-19.187	-20.412	-20.250	-19.899	1.822	.128	.134	1.298
7500	3.00	0.00	-19.505	-20.239	-19.850	-26.892	.113	.216	-.038	-19.288	-20.377	-20.214	-19.884	1.684	.150	.141	1.101
7500	3.50	0.00	-19.554	-20.193	-19.829	-26.892	.041	.240	-.059	-19.393	-20.291	-20.177	-19.863	1.543	.165	.146	.921
7500	4.00	0.00	-19.612	-20.147	-19.805	-26.892	-.040	.262	-.083	-19.499	-20.236	-20.139	-19.838	1.399	.178	.149	.744
7500	4.50	0.00	-19.675	-20.105	-19.781	-26.892	-.124	.280	-.107	-19.600	-20.186	-20.103	-19.814	1.262	.190	.152	.576
8000	1.00	0.00	-19.935	-20.664	-20.113	-27.172	.063	.055	-.055	-19.473	-20.826	-20.559	-20.151	1.845	.071	.085	1.531
8000	1.50	0.00	-19.889	-20.699	-20.120	-27.172	.140	.026	-.048	-19.432	-20.875	-20.591	-20.157	1.918	.045	.095	1.437
8000	2.00	0.00	-19.841	-20.689	-20.121	-27.172	.177	.036	-.047	-19.453	-20.863	-20.593	-20.142	1.859	.044	.110	1.591
8000	2.50	0.00	-19.797	-20.649	-20.106	-27.172	.193	.061	-.062	-19.479	-20.814	-20.570	-20.142	1.851	.051	.129	1.489
8000	3.00	0.00	-19.826	-20.613	-20.112	-27.172	.150	.103	-.056	-19.583	-20.762	-20.552	-20.148	1.728	.075	.140	1.298
8000	3.50	0.00	-19.859	-20.550	-20.102	-27.172	.080	.157	-.066	-19.677	-20.676	-20.511	-20.138	1.592	.107	.152	1.073
8000	4.00	0.00	-19.906	-20.496	-20.083	-27.172	.003	.191	-.085	-19.774	-20.607	-20.470	-20.119	1.454	.128	.158	.881
8000	4.50	0.00	-19.963	-20.445	-20.058	-27.172	-.082	.217	-.110	-19.874	-20.546	-20.429	-20.093	1.314	.144	.163	.700

TABLE 5A—Continued

TEFF	LOG G	LOG A	U	B	V	B0L	U-B	B-V	BC	U	V	B	Y	U-B	B-Y	M1	C1
8500	1.00	0.00	-20.334	-20.803	-20.264	-27.435	-1.149	.067	-.167	-20.004	-20.960	-20.689	-20.301	1.444	.092	.061	1.137
8500	1.50	0.00	-20.251	-20.910	-20.307	-27.435	.007	.002	-.124	-19.848	-21.089	-20.785	-20.346	1.696	.040	.080	1.455
8500	2.00	0.00	-20.205	-20.931	-20.316	-27.435	.070	.010	-.115	-19.829	-21.117	-20.809	-20.355	1.739	.024	.093	1.505
8500	2.50	0.00	-20.167	-20.926	-20.321	-27.435	.107	0.000	-.110	-19.849	-21.108	-20.817	-20.359	1.727	.022	.111	1.460
8500	3.00	0.00	-20.144	-20.903	-20.322	-27.435	.118	.024	-.109	-19.889	-21.076	-20.812	-20.360	1.681	.027	.132	1.361
8500	3.50	0.00	-20.139	-20.868	-20.318	-27.435	.106	.054	-.113	-19.943	-21.030	-20.799	-20.356	1.615	.036	.156	1.228
8500	4.00	0.00	-20.151	-20.823	-20.307	-27.435	.069	.088	-.124	-20.007	-20.969	-20.776	-20.345	1.527	.048	.183	1.064
8500	4.50	0.00	-20.182	-20.772	-20.290	-27.435	.009	.122	-.141	-20.080	-20.901	-20.745	-20.329	1.424	.063	.205	.887
9000	1.50	0.00	-20.579	-21.066	-20.455	-27.683	-.134	-.006	-.224	-20.250	-21.245	-20.932	-20.494	1.441	.041	.069	1.219
9000	2.00	0.00	-20.517	-21.113	-20.474	-27.683	-.040	-.034	-.205	-20.176	-21.303	-20.977	-20.514	1.559	.016	.082	1.362
9000	2.50	0.00	-20.473	-21.121	-20.481	-27.683	.010	-.035	-.198	-20.169	-21.312	-20.992	-20.521	1.583	.007	.097	1.373
9000	3.00	0.00	-20.440	-21.110	-20.486	-27.683	.040	-.019	-.193	-20.189	-21.296	-20.997	-20.526	1.567	.008	.118	1.315
9000	3.50	0.00	-20.423	-21.088	-20.488	-27.683	.046	.005	-.191	-20.226	-21.264	-20.994	-20.528	1.527	.013	.142	1.217
9000	4.00	0.00	-20.419	-21.054	-20.486	-27.683	.033	.037	-.193	-20.273	-21.217	-20.985	-20.526	1.471	.021	.171	1.087
9000	4.50	0.00	-20.433	-21.012	-20.480	-27.683	-.003	.072	-.199	-20.328	-21.158	-20.967	-20.520	1.398	.032	.201	.931
9400	3.90	0.00	-20.620	-21.211	-20.604	-27.872	-.009	-.003	-.264	-20.464	-21.387	-21.120	-20.644	1.415	.003	.153	1.101
9400	3.95	0.00	-20.619	-21.208	-20.604	-27.872	-.010	0.000	-.264	-20.468	-21.383	-21.119	-20.644	1.411	.004	.156	1.089
9400	4.00	0.00	-20.619	-21.205	-20.604	-27.872	-.011	.003	-.264	-20.472	-21.379	-21.119	-20.644	1.411	.004	.160	1.077
9500	1.50	0.00	-20.875	-21.201	-20.583	-27.918	-.264	-.013	-.331	-20.622	-21.381	-21.061	-20.622	1.198	.040	.063	.990
9500	2.00	0.00	-20.800	-21.262	-20.610	-27.918	-.151	-.046	-.304	-20.511	-21.453	-21.117	-20.650	1.365	.012	.075	1.189
9500	2.50	0.00	-20.748	-21.280	-20.619	-27.918	-.087	-.056	-.295	-20.472	-21.476	-21.139	-20.659	1.427	-.001	.089	1.251
9500	3.00	0.00	-20.707	-21.278	-20.624	-27.918	-.046	-.050	-.290	-20.468	-21.472	-21.149	-20.664	1.440	-.006	.107	1.237
9500	3.50	0.00	-20.679	-21.263	-20.628	-27.918	-.025	-.031	-.286	-20.486	-21.450	-21.151	-20.668	1.424	-.004	.129	1.173
9500	3.90	0.00	-20.668	-21.245	-20.630	-27.918	-.022	-.010	-.284	-20.512	-21.423	-21.150	-20.671	1.397	0.000	.151	1.095
9500	4.00	0.00	-20.666	-21.239	-20.631	-27.918	-.023	0.000	-.283	-20.519	-21.415	-21.149	-20.671	1.389	.001	.157	1.072
9500	4.50	0.00	-20.666	-21.205	-20.630	-27.918	-.041	.030	-.284	-20.561	-21.366	-21.141	-20.671	1.339	.009	.190	.939
10000	1.50	0.00	-21.141	-21.326	-20.700	-28.141	-.378	-.021	-.437	-20.947	-21.508	-21.181	-20.739	.992	.037	.060	.797
10000	2.00	0.00	-21.055	-21.394	-20.732	-28.141	-.251	-.057	-.405	-20.816	-21.588	-21.243	-20.772	1.186	.008	.071	1.026
10000	2.50	0.00	-20.997	-21.417	-20.742	-28.141	-.180	-.070	-.395	-20.757	-21.615	-21.268	-20.782	1.270	-.007	.084	1.116
10000	3.00	0.00	-20.952	-21.420	-20.746	-28.141	-.134	-.069	-.391	-20.735	-21.618	-21.279	-20.786	1.304	-.014	.099	1.132
10000	3.50	0.00	-20.917	-21.410	-20.750	-28.141	-.104	-.056	-.387	-20.736	-21.604	-21.284	-20.790	1.308	-.015	.119	1.098
10000	4.00	0.00	-20.895	-21.392	-20.752	-28.141	-.090	-.035	-.385	-20.752	-21.578	-21.286	-20.793	1.292	-.013	.145	1.028
10000	4.50	0.00	-20.885	-21.365	-20.755	-28.141	-.094	-.006	-.382	-20.781	-21.538	-21.283	-20.796	1.261	-.008	.177	.922
10500	4.00	0.00	-21.108	-21.525	-20.862	-28.353	-.159	-.059	-.487	-20.973	-21.718	-21.406	-20.903	1.193	-.024	.137	.966
11000	2.00	0.00	-21.496	-21.625	-20.945	-28.555	-.421	-.075	-.606	-21.333	-21.822	-21.465	-20.985	.891	-.001	.068	.757
11000	2.50	0.00	-21.431	-21.652	-20.957	-28.555	-.342	-.091	-.594	-21.258	-21.855	-21.493	-20.997	.994	-.017	.078	.870
11000	3.00	0.00	-21.379	-21.658	-20.959	-28.555	-.290	-.094	-.592	-21.213	-21.862	-21.504	-21.000	1.050	-.025	.091	.917
11000	3.50	0.00	-21.337	-21.653	-20.960	-28.555	-.252	-.089	-.591	-21.189	-21.855	-21.510	-21.001	1.080	-.030	.108	.922
11000	4.00	0.00	-21.305	-21.641	-20.961	-28.555	-.228	-.076	-.590	-21.182	-21.838	-21.513	-21.002	1.089	-.031	.130	.891
11000	4.50	0.00	-21.285	-21.623	-20.963	-28.555	-.218	-.056	-.588	-21.189	-21.812	-21.514	-21.005	1.084	-.031	.157	.831
11500	4.00	0.00	-21.490	-21.747	-21.054	-28.748	-.295	-.089	-.690	-21.380	-21.947	-21.611	-21.095	.990	-.037	.124	.813
12000	2.00	0.00	-21.851	-21.821	-21.124	-28.933	-.551	-.092	-.805	-21.734	-22.022	-21.654	-21.165	.679	-.010	.067	.565
12000	2.50	0.00	-21.788	-21.852	-21.138	-28.933	-.471	-.109	-.791	-21.660	-22.058	-21.684	-21.179	.783	-.026	.076	.682
12000	3.00	0.00	-21.737	-21.858	-21.141	-28.933	-.419	-.113	-.788	-21.613	-22.066	-21.695	-21.182	.841	-.034	.087	.735
12000	3.50	0.00	-21.694	-21.854	-21.141	-28.933	-.382	-.109	-.786	-21.582	-22.061	-21.700	-21.182	.877	-.039	.102	.751
12000	4.00	0.00	-21.660	-21.844	-21.140	-28.933	-.356	-.099	-.789	-21.564	-22.047	-21.702	-21.182	.897	-.041	.120	.738
12000	4.50	0.00	-21.634	-21.829	-21.140	-28.933	-.341	-.085	-.789	-21.556	-22.026	-21.702	-21.181	.905	-.042	.143	.702
12500	4.00	0.00	-21.816	-21.934	-21.221	-29.110	-.412	-.109	-.885	-21.732	-22.140	-21.787	-21.262	.814	-.046	.117	.670

TABLE 5A—Continued

TEFF	LOG G	LOG A	U	B	V	BOI	U-B	B-V	BC	U	V	B	Y	U-B	B-Y	M1	C1
13000	2.00	0.00	-22.150	-21.994	-21.282	-29.280	-.655	-.107	-.994	-22.063	-22.198	-21.821	-21.323	.516	-.019	.066	.421
13000	2.50	0.00	-22.085	-22.026	-21.296	-29.280	-.572	-.126	-.980	-21.986	-22.236	-21.851	-21.337	.625	-.036	.075	.546
13000	3.00	0.00	-22.034	-22.032	-21.298	-29.280	-.522	-.130	-.978	-21.938	-22.244	-21.861	-21.339	.682	-.044	.085	.599
13000	3.50	0.00	-21.993	-22.028	-21.297	-29.280	-.486	-.127	-.979	-21.906	-22.239	-21.865	-21.338	.718	-.048	.098	.617
13000	4.00	0.00	-21.960	-22.018	-21.296	-29.280	-.462	-.118	-.980	-21.887	-22.226	-21.867	-21.337	.739	-.050	.104	.610
13000	4.50	0.00	-21.934	-22.004	-21.295	-29.280	-.447	-.105	-.981	-21.875	-22.207	-21.866	-21.336	.751	-.051	.135	.582
14000	2.00	0.00	-22.416	-22.151	-21.427	-29.602	-.745	-.120	-1.171	-22.353	-22.358	-21.973	-21.468	.379	-.026	.065	.300
14000	2.50	0.00	-22.341	-22.183	-21.438	-29.602	-.655	-.141	-1.160	-22.263	-22.397	-22.002	-21.479	.499	-.044	.074	.439
14000	3.00	0.00	-22.288	-22.187	-21.437	-29.602	-.604	-.146	-1.161	-22.211	-22.403	-22.000	-21.478	.558	-.052	.083	.495
14000	3.50	0.00	-22.247	-22.182	-21.434	-29.602	-.570	-.143	-1.164	-22.178	-22.384	-22.011	-21.476	.592	-.057	.095	.514
14000	4.00	0.00	-22.216	-22.172	-21.433	-29.602	-.547	-.135	-1.165	-22.157	-22.379	-22.012	-21.475	.614	-.058	.110	.509
14000	4.50	0.00	-22.191	-22.158	-21.432	-29.602	-.534	-.123	-1.166	-22.145	-22.366	-22.012	-21.473	.625	-.059	.129	.485
15000	2.00	0.00	-22.661	-22.293	-21.560	-29.902	-.831	-.129	-1.338	-22.618	-22.502	-22.111	-21.601	.252	-.031	.064	.185
15000	2.50	0.00	-22.573	-22.329	-21.570	-29.902	-.727	-.155	-1.328	-22.510	-22.546	-22.142	-21.611	.391	-.052	.073	.349
15000	3.00	0.00	-22.513	-22.329	-21.564	-29.902	-.674	-.161	-1.334	-22.450	-22.548	-22.145	-21.606	.454	-.061	.082	.411
15000	3.50	0.00	-22.470	-22.321	-21.559	-29.902	-.640	-.158	-1.339	-22.413	-22.540	-22.144	-21.601	.490	-.065	.093	.432
15000	4.00	0.00	-22.439	-22.311	-21.556	-29.902	-.619	-.150	-1.342	-22.392	-22.527	-22.144	-21.598	.511	-.066	.107	.428
15000	4.50	0.00	-22.416	-22.297	-21.555	-29.902	-.606	-.139	-1.343	-22.379	-22.509	-22.142	-21.597	.522	-.067	.124	.406
16000	2.00	0.00	-22.895	-22.422	-21.685	-30.182	-.919	-.134	-1.493	-22.871	-22.632	-22.237	-21.726	.125	-.032	.060	.066
16000	2.50	0.00	-22.787	-22.466	-21.694	-30.182	-.792	-.167	-1.484	-22.738	-22.686	-22.274	-21.736	.295	-.059	.072	.269
16000	3.00	0.00	-22.718	-22.462	-21.684	-30.182	-.734	-.174	-1.494	-22.667	-22.685	-22.273	-21.726	.365	-.068	.080	.340
16000	3.50	0.00	-22.670	-22.451	-21.675	-30.182	-.700	-.172	-1.503	-22.624	-22.673	-22.268	-21.717	.403	-.072	.091	.364
16000	4.00	0.00	-22.638	-22.438	-21.670	-30.182	-.680	-.164	-1.508	-22.600	-22.658	-22.265	-21.712	.424	-.074	.104	.361
16000	4.50	0.00	-22.614	-22.424	-21.667	-30.182	-.668	-.153	-1.511	-22.586	-22.639	-22.262	-21.709	.435	-.074	.120	.341
17000	2.00	0.00	-23.118	-22.531	-21.795	-30.445	-1.015	-.131	-1.646	-23.114	-22.740	-22.343	-21.837	-.012	-.027	.054	-.066
17000	2.50	0.00	-22.991	-22.596	-21.815	-30.445	-.853	-.178	-1.626	-22.953	-22.818	-22.400	-21.857	.206	-.064	.070	.195
17000	3.00	0.00	-22.910	-22.588	-21.798	-30.445	-.790	-.187	-1.634	-22.868	-22.814	-22.394	-21.840	.285	-.075	.079	.277
17000	3.50	0.00	-22.855	-22.573	-21.784	-30.445	-.754	-.185	-1.657	-22.817	-22.798	-22.384	-21.827	.327	-.079	.089	.306
17000	4.00	0.00	-22.819	-22.556	-21.775	-30.445	-.733	-.177	-1.666	-22.788	-22.779	-22.377	-21.818	.348	-.080	.102	.304
17000	4.50	0.00	-22.794	-22.542	-21.772	-30.445	-.721	-.167	-1.669	-22.771	-22.761	-22.374	-21.814	.361	-.081	.117	.287
18000	2.50	0.00	-23.184	-22.718	-21.929	-30.694	-.914	-.185	-1.761	-23.156	-22.942	-22.518	-21.971	.119	-.068	.068	.117
18000	3.00	0.00	-23.091	-22.709	-21.908	-30.694	-.841	-.198	-1.782	-23.057	-22.938	-22.510	-21.950	.212	-.081	.077	.218
18000	3.50	0.00	-23.029	-22.690	-21.889	-30.694	-.802	-.197	-1.801	-22.997	-22.918	-22.496	-21.931	.258	-.085	.087	.253
18000	4.00	0.00	-22.987	-22.671	-21.877	-30.694	-.780	-.190	-1.813	-22.962	-22.897	-22.485	-21.920	.283	-.087	.100	.256
18000	4.50	0.00	-22.960	-22.654	-21.870	-30.694	-.768	-.179	-1.820	-22.942	-22.876	-22.479	-21.913	.296	-.087	.114	.240
20000	2.50	0.00	-23.548	-22.946	-22.149	-31.151	-1.028	-.193	-1.998	-23.541	-23.172	-22.740	-22.192	-.042	-.069	.061	-.027
20000	3.00	0.00	-23.430	-22.938	-22.119	-31.151	-.955	-.215	-2.028	-23.410	-23.170	-22.730	-22.162	.079	-.089	.074	.109
20000	3.50	0.00	-23.350	-22.910	-22.089	-31.151	-.889	-.217	-2.058	-23.329	-23.143	-22.706	-22.132	.136	-.096	.083	.160
20000	4.00	0.00	-23.298	-22.884	-22.069	-31.151	-.864	-.212	-2.078	-23.281	-23.116	-22.689	-22.112	.166	-.098	.095	.171
20000	4.50	0.00	-23.263	-22.862	-22.056	-31.151	-.850	-.202	-2.091	-23.252	-23.090	-22.676	-22.099	.183	-.098	.108	.162
22500	3.00	0.00	-23.809	-23.196	-22.364	-31.663	-1.037	-.229	-2.295	-23.804	-23.432	-22.980	-22.407	-.065	-.094	.066	-.009
22500	3.50	0.00	-23.717	-23.185	-22.325	-31.663	-.984	-.236	-2.334	-23.708	-23.403	-22.952	-22.369	.003	-.104	.077	.056
22500	4.00	0.00	-23.650	-23.132	-22.294	-31.663	-.954	-.234	-2.365	-23.643	-23.368	-22.925	-22.338	.042	-.108	.089	.079
22500	4.50	0.00	-23.605	-23.103	-22.273	-31.663	-.937	-.226	-2.386	-23.601	-23.337	-22.905	-22.317	.063	-.109	.101	.078
25000	3.00	0.00	-24.131	-23.428	-22.582	-32.120	-1.115	-.242	-2.534	-24.134	-23.667	-23.203	-22.625	-.173	-.099	.058	-.093
25000	3.50	0.00	-24.033	-23.392	-22.537	-32.120	-1.061	-.251	-2.579	-24.032	-23.634	-23.169	-22.580	.103	-.110	.070	-.023
25000	4.00	0.00	-23.965	-23.359	-22.505	-32.120	-1.029	-.251	-2.611	-23.965	-23.600	-23.143	-22.549	.063	-.115	.081	.003
25000	4.50	0.00	-23.915	-23.325	-22.476	-32.120	-1.013	-.245	-2.640	-23.915	-23.564	-23.116	-22.520	.040	-.117	.093	.007
25000	5.00	0.00	-23.875	-23.297	-22.456	-32.120	-1.001	-.238	-2.660	-23.880	-23.533	-23.090	-22.500	-.023	-.119	.107	-.001

TABLE 5A—Continued

TEFF	LOG G	LOG A	U	B	V	80L	U-B	B-V	BC	U	V	B	Y	U-B	B-Y	M1	C1
30000	3.50	0.00	-24.577	-23.810	-22.931	-32.912	-1.169	-2.275	-2.977	-24.586	-24.058	-23.572	-22.974	-2.254	-.120	.058	-.132
30000	4.00	0.00	-24.498	-23.770	-22.885	-32.912	-1.135	-.281	-3.023	-24.505	-24.020	-23.536	-22.929	-.211	-.128	.068	-.091
30000	4.50	0.00	-24.440	-23.728	-22.847	-32.912	-1.120	-.277	-3.061	-24.448	-23.976	-23.500	-22.891	-.189	-.130	.078	-.086
30000	5.00	0.00	-24.404	-23.700	-22.825	-32.912	-1.112	-.271	-3.083	-24.414	-23.946	-23.480	-22.869	-.175	-.132	.090	-.093
35000	3.50	0.00	-24.904	-24.068	-23.189	-33.582	-1.229	-.275	-3.389	-24.917	-24.315	-23.828	-23.231	-.331	-.118	.055	-.205
35000	4.00	0.00	-24.913	-24.100	-23.204	-33.582	-1.209	-.293	-3.374	-24.925	-24.332	-23.856	-23.226	-.310	-.131	.058	-.167
35000	4.50	0.00	-24.882	-24.084	-23.182	-33.582	-1.195	-.299	-3.396	-24.894	-24.338	-23.842	-23.225	-.293	-.138	.066	-.150
35000	5.00	0.00	-24.850	-24.061	-23.160	-33.582	-1.187	-.298	-3.418	-24.864	-24.314	-23.823	-23.203	-.281	-.141	.075	-.150
40000	4.00	0.00	-25.131	-24.284	-23.380	-34.162	-1.239	-.300	-3.778	-25.143	-24.537	-24.036	-23.422	-.349	-.135	.057	-.195
40000	4.50	0.00	-25.143	-24.302	-23.393	-34.162	-1.233	-.306	-3.765	-25.156	-24.552	-24.036	-23.434	-.344	-.140	.060	-.185
40000	5.00	0.00	-25.145	-24.307	-23.396	-34.162	-1.230	-.307	-3.762	-25.159	-24.552	-24.060	-23.438	-.340	-.143	.065	-.185
45000	4.50	0.00	-25.302	-24.441	-23.525	-34.673	-1.250	-.313	-4.144	-25.315	-24.698	-24.189	-23.566	-.366	-.144	.060	-.198
45000	5.00	0.00	-25.308	-24.449	-23.531	-34.673	-1.249	-.314	-4.138	-25.322	-24.706	-24.198	-23.572	-.365	-.146	.062	-.198
50000	4.50	0.00	-25.436	-24.561	-23.640	-35.131	-1.263	-.318	-4.487	-25.449	-24.819	-24.307	-23.681	-.383	-.147	.059	-.208
50000	5.00	0.00	-25.439	-24.565	-23.641	-35.131	-1.261	-.321	-4.486	-25.452	-24.823	-24.311	-23.683	-.382	-.150	.061	-.206
5500	2.00	-1.00	-17.690	-18.306	-18.289	-25.545	.037	.588	-.252	-17.566	-18.272	-18.382	-18.308	1.575	.405	.129	.506
5500	2.50	-1.00	-17.760	-18.293	-18.276	-25.545	-.029	.588	-.265	-17.671	-18.259	-18.368	-18.294	1.455	.405	.127	.389
5500	3.00	-1.00	-17.808	-18.279	-18.266	-25.545	-.077	.592	-.275	-17.746	-18.243	-18.356	-18.284	1.368	.407	.129	.295
5500	3.50	-1.00	-17.835	-18.266	-18.259	-25.545	-.106	.599	-.282	-17.793	-18.227	-18.346	-18.277	1.312	.410	.133	.225
5500	4.00	-1.00	-17.847	-18.255	-18.256	-25.545	-.121	.606	-.285	-17.821	-18.213	-18.340	-18.274	1.278	.413	.138	.175
5500	4.50	-1.00	-17.850	-18.247	-18.255	-25.545	-.125	.613	-.286	-17.837	-18.201	-18.338	-18.273	1.260	.414	.146	.138
6000	2.00	-1.00	-18.277	-18.913	-18.755	-25.923	.038	.447	-.164	-18.095	-18.941	-18.940	-18.779	1.603	.328	.105	.756
6000	2.50	-1.00	-18.346	-18.884	-18.734	-25.923	-.039	.456	-.185	-18.213	-18.908	-18.912	-18.757	1.459	.324	.104	.601
6000	3.00	-1.00	-18.409	-18.855	-18.715	-25.923	-.112	.466	-.204	-18.315	-18.874	-18.886	-18.738	1.330	.331	.104	.458
6000	3.50	-1.00	-18.457	-18.829	-18.701	-25.923	-.170	.477	-.218	-18.393	-18.843	-18.864	-18.724	1.231	.338	.107	.339
6000	4.00	-1.00	-18.489	-18.809	-18.693	-25.923	-.211	.489	-.226	-18.446	-18.817	-18.849	-18.715	1.162	.345	.111	.249
6000	4.50	-1.00	-18.507	-18.793	-18.688	-25.923	-.237	.500	-.231	-18.478	-18.796	-18.838	-18.710	1.119	.352	.114	.186
6500	2.00	-1.00	-18.725	-19.441	-19.165	-26.270	.093	.330	-.101	-18.479	-19.512	-19.431	-19.194	1.711	.242	.102	1.024
6500	2.50	-1.00	-18.784	-19.401	-19.141	-26.270	.017	.345	-.125	-18.598	-19.467	-19.395	-19.169	1.557	.252	.100	.851
6500	3.00	-1.00	-18.849	-19.361	-19.116	-26.270	-.066	.360	-.150	-18.713	-19.420	-19.359	-19.143	1.405	.263	.100	.678
6500	3.50	-1.00	-18.912	-19.323	-19.092	-26.270	-.147	.375	-.174	-18.818	-19.376	-19.325	-19.119	1.266	.273	.101	.518
6500	4.00	-1.00	-18.969	-19.290	-19.073	-26.270	-.219	.389	-.193	-18.906	-19.336	-19.297	-19.100	1.150	.282	.102	.380
6500	4.50	-1.00	-19.012	-19.264	-19.061	-26.270	-.274	.402	-.205	-18.970	-19.305	-19.275	-19.087	1.064	.290	.104	.274
7000	2.00	-1.00	-19.108	-19.908	-19.528	-26.592	.154	.226	-.060	-18.799	-20.015	-19.868	-19.561	1.828	.171	.106	1.273
7000	2.50	-1.00	-19.150	-19.858	-19.450	-26.592	.085	.252	-.083	-18.911	-19.956	-19.827	-19.536	1.675	.188	.107	1.084
7000	3.00	-1.00	-19.202	-19.811	-19.478	-26.592	.009	.272	-.110	-19.023	-19.900	-19.786	-19.509	1.522	.202	.108	.901
7000	3.50	-1.00	-19.265	-19.764	-19.450	-26.592	-.077	.291	-.138	-19.137	-19.846	-19.745	-19.480	1.367	.214	.109	.720
7000	4.00	-1.00	-19.330	-19.720	-19.423	-26.592	-.164	.308	-.165	-19.242	-19.795	-19.706	-19.452	1.223	.225	.110	.551
7000	4.50	-1.00	-19.392	-19.682	-19.400	-26.592	-.246	.324	-.188	-19.335	-19.750	-19.673	-19.429	1.096	.236	.111	.402
7500	2.00	-1.00	-19.466	-20.331	-19.832	-26.892	.197	.106	-.056	-19.102	-20.482	-20.253	-19.867	1.909	.093	.102	1.518
7500	2.50	-1.00	-19.482	-20.268	-19.822	-26.892	.143	.160	-.066	-19.198	-20.396	-20.212	-19.857	1.772	.125	.115	1.292
7500	3.00	-1.00	-19.519	-20.213	-19.800	-26.892	.075	.192	-.088	-19.301	-20.328	-20.170	-19.835	1.628	.144	.122	1.095
7500	3.50	-1.00	-19.566	-20.160	-19.773	-26.892	-.001	.218	-.115	-19.406	-20.265	-20.126	-19.807	1.479	.160	.125	.908
7500	4.00	-1.00	-19.627	-20.108	-19.743	-26.892	-.089	.240	-.145	-19.514	-20.204	-20.081	-19.776	1.326	.174	.126	.724
7500	4.50	-1.00	-19.692	-20.060	-19.713	-26.892	-.181	.259	-.175	-19.618	-20.148	-20.038	-19.746	1.180	.187	.127	.550

TABLE 5A—Continued

TEFF	LOG G	LOG A	U	B	V	B0L	U-R	B-V	BC	U	V	B	Y	U-B	B-Y	M1	C1
8000	2.00	-1.00	-19.819	-20.664	-20.079	-27.172	.172	.020	-.089	-19.426	-20.840	-20.556	-20.116	1.889	.039	.100	1.608
8000	2.50	-1.00	-19.799	-20.630	-20.071	-27.172	.172	.046	-.097	-19.482	-20.797	-20.538	-20.109	1.816	.049	.116	1.484
8000	3.00	-1.00	-19.811	-20.572	-20.065	-27.172	.125	.097	-.103	-19.566	-20.720	-20.502	-20.102	1.816	.079	.128	1.282
8000	3.50	-1.00	-19.846	-20.512	-20.053	-27.172	.056	.145	-.115	-19.661	-20.640	-20.462	-20.089	1.559	.107	.139	1.066
8000	4.00	-1.00	-19.894	-20.455	-20.027	-27.172	-.024	.177	-.141	-19.760	-20.570	-20.417	-20.064	1.416	.126	.145	.873
8000	4.50	-1.00	-19.953	-20.400	-19.998	-27.172	-.115	.203	-.170	-19.862	-20.505	-20.371	-20.033	1.268	.142	.148	.687
8500	2.00	-1.00	-20.158	-20.906	-20.277	-27.435	.086	-.024	-.154	-19.769	-21.092	-20.779	-20.315	1.769	.015	.097	1.545
8500	2.50	-1.00	-20.113	-20.897	-20.277	-27.435	.127	.005	-.154	-19.874	-21.079	-20.784	-20.315	1.759	.010	.119	1.500
8500	3.00	-1.00	-20.087	-20.871	-20.272	-27.435	.139	.015	-.159	-19.822	-21.045	-20.777	-20.310	1.714	.012	.140	1.402
8500	3.50	-1.00	-20.079	-20.833	-20.259	-27.435	.126	.030	-.172	-19.874	-20.995	-20.760	-20.296	1.645	.015	.174	1.267
8500	4.00	-1.00	-20.091	-20.784	-20.239	-27.435	.086	.059	-.192	-19.938	-20.931	-20.734	-20.276	1.554	.021	.206	1.100
8500	4.50	-1.00	-20.119	-20.726	-20.210	-27.435	.022	.088	-.221	-20.010	-20.856	-20.696	-20.247	1.445	.029	.234	.916
9000	2.00	-1.00	-20.471	-21.076	-20.433	-27.683	-.033	-.038	-.246	-20.124	-21.265	-20.939	-20.472	1.573	.013	.066	1.376
9000	2.50	-1.00	-20.422	-21.084	-20.440	-27.683	.022	-.039	-.239	-20.112	-21.273	-20.955	-20.479	1.602	.003	.103	1.390
9000	3.00	-1.00	-20.380	-21.075	-20.443	-27.683	.061	-.028	-.236	-20.120	-21.260	-20.962	-20.482	1.600	-.001	.127	1.347
9000	3.50	-1.00	-20.353	-21.052	-20.441	-27.683	.075	-.007	-.238	-20.147	-21.228	-20.960	-20.480	1.571	-.001	.157	1.258
9000	4.00	-1.00	-20.344	-21.015	-20.432	-27.683	.064	.021	-.247	-20.189	-21.177	-20.947	-20.471	1.517	.002	.192	1.127
9000	4.50	-1.00	-20.355	-20.967	-20.415	-27.683	.025	.051	-.264	-20.242	-21.112	-20.925	-20.454	1.441	.008	.229	.967
9500	2.00	-1.00	-20.748	-21.216	-20.565	-27.918	-.145	-.047	-.349	-20.455	-21.406	-21.072	-20.604	1.376	.011	.079	1.195
9500	2.50	-1.00	-20.697	-21.238	-20.576	-27.918	-.080	-.057	-.338	-20.417	-21.431	-21.098	-20.616	1.439	-.003	.088	1.258
9500	3.00	-1.00	-20.652	-21.238	-20.583	-27.918	-.033	-.051	-.331	-20.409	-21.429	-21.110	-20.622	1.460	-.009	.114	1.249
9500	3.50	-1.00	-20.618	-21.225	-20.586	-27.918	-.005	-.034	-.328	-20.420	-21.410	-21.115	-20.626	1.454	-.010	.140	1.194
9500	4.00	-1.00	-20.597	-21.200	-20.586	-27.918	.004	-.010	-.328	-20.445	-21.374	-21.114	-20.626	1.428	-.009	.173	1.100
9500	4.50	-1.00	-20.594	-21.163	-20.581	-27.918	-.014	.021	-.328	-20.484	-21.321	-21.104	-20.621	1.379	-.005	.212	.964
10000	2.00	-1.00	-20.993	-21.342	-20.682	-28.141	-.242	-.055	-.455	-20.749	-21.533	-21.192	-20.721	1.202	.008	.075	1.035
10000	2.50	-1.00	-20.940	-21.367	-20.695	-28.141	-.173	-.068	-.442	-20.697	-21.563	-21.220	-20.734	1.283	-.007	.088	1.120
10000	3.00	-1.00	-20.898	-21.373	-20.702	-28.141	-.127	-.066	-.435	-20.679	-21.568	-21.234	-20.742	1.314	-.013	.103	1.133
10000	3.50	-1.00	-20.860	-21.368	-20.708	-28.141	-.090	-.056	-.429	-20.675	-21.559	-21.244	-20.748	1.328	-.018	.127	1.109
10000	4.00	-1.00	-20.837	-21.349	-20.712	-28.141	-.077	-.033	-.425	-20.692	-21.531	-21.245	-20.752	1.312	-.014	.151	1.035
10000	4.50	-1.00	-20.818	-21.326	-20.713	-28.141	-.069	-.009	-.424	-20.711	-21.496	-21.249	-20.754	1.297	-.016	.194	.942
5500	2.00	-2.00	-17.802	-18.320	-18.261	-25.545	-.056	.548	-.280	-17.682	-18.309	-18.361	-18.280	1.438	.398	.079	.484
5500	2.50	-2.00	-17.867	-18.300	-18.247	-25.545	-.124	.554	-.294	-17.781	-18.286	-18.342	-18.265	1.320	.402	.078	.359
5500	3.00	-2.00	-17.906	-18.282	-18.238	-25.545	-.170	.563	-.303	-17.843	-18.264	-18.327	-18.256	1.242	.408	.079	.267
5500	3.50	-2.00	-17.924	-18.266	-18.234	-25.545	-.196	.585	-.307	-17.876	-18.243	-18.314	-18.251	1.197	.416	.080	.206
5500	4.00	-2.00	-17.930	-18.254	-18.233	-25.545	-.209	.585	-.308	-17.891	-18.226	-18.306	-18.250	1.174	.423	.081	.165
5500	4.50	-2.00	-17.933	-18.245	-18.230	-25.545	-.218	.591	-.311	-17.900	-18.214	-18.299	-18.247	1.158	.427	.082	.140
6000	2.00	-2.00	-18.349	-18.914	-18.724	-25.923	-.028	.416	-.195	-18.174	-18.955	-18.915	-18.748	1.500	.311	.073	.731
6000	2.50	-2.00	-18.418	-18.879	-18.700	-25.923	-.110	.427	-.219	-18.291	-18.916	-18.882	-18.723	1.350	.320	.071	.568
6000	3.00	-2.00	-18.478	-18.847	-18.680	-25.923	-.184	.440	-.239	-18.388	-18.878	-18.853	-18.703	1.224	.329	.070	.425
6000	3.50	-2.00	-18.525	-18.816	-18.663	-25.923	-.247	.453	-.256	-18.464	-18.842	-18.827	-18.686	1.122	.338	.071	.303
6000	4.00	-2.00	-18.554	-18.795	-18.656	-25.923	-.287	.467	-.263	-18.509	-18.814	-18.810	-18.678	1.059	.347	.072	.219
6000	4.50	-2.00	-18.569	-18.780	-18.652	-25.923	-.312	.479	-.267	-18.555	-18.793	-18.798	-18.674	1.022	.356	.073	.164
6500	2.00	-2.00	-18.764	-19.435	-19.137	-26.270	.051	.308	-.129	-18.524	-19.514	-19.407	-19.165	1.642	.237	.080	1.007
6500	2.50	-2.00	-18.824	-19.388	-19.108	-26.270	-.031	.325	-.158	-18.644	-19.461	-19.365	-19.136	1.480	.250	.079	.823
6500	3.00	-2.00	-18.889	-19.342	-19.078	-26.270	-.119	.342	-.188	-18.759	-19.408	-19.324	-19.106	1.323	.261	.078	.643
6500	3.50	-2.00	-18.952	-19.300	-19.052	-26.270	-.203	.358	-.214	-18.862	-19.359	-19.285	-19.079	1.182	.273	.077	.481
6500	4.00	-2.00	-19.008	-19.265	-19.032	-26.270	-.278	.373	-.234	-18.948	-19.318	-19.254	-19.058	1.064	.283	.077	.344
6500	4.50	-2.00	-19.050	-19.239	-19.020	-26.270	-.333	.387	-.246	-19.009	-19.286	-19.231	-19.046	.981	.294	.075	.243

TABLE 5A—Continued

TEFF	LOG G	LOG A	U	B	V	B0L	U-B	B-V	BC	U	V	B	Y	U-B	B-V	M1	C1
7000	2.00	-2.00	-19.127	-19.906	-19.506	-26.592	.132	.206	-.082	-18.818	-20.018	-19.853	-19.539	1.793	.165	.093	1.276
7000	2.50	-2.00	-19.167	-19.844	-19.476	-26.592	.057	.238	-.112	-18.930	-19.945	-19.801	-19.508	1.630	.186	.094	1.068
7000	3.00	-2.00	-19.219	-19.791	-19.445	-26.592	-.024	.260	-.143	-19.044	-19.884	-19.755	-19.476	1.470	.201	.094	.879
7000	3.50	-2.00	-19.282	-19.739	-19.412	-26.592	-.115	.279	-.176	-19.156	-19.824	-19.708	-19.443	1.311	.214	.094	.694
7000	4.00	-2.00	-19.348	-19.691	-19.382	-26.592	-.207	.297	-.206	-19.264	-19.769	-19.664	-19.412	1.160	.227	.093	.520
7000	4.50	-2.00	-19.411	-19.651	-19.358	-26.592	-.291	.313	-.230	-19.355	-19.722	-19.628	-19.387	1.032	.238	.092	.371
7500	2.00	-2.00	-19.464	-20.313	-19.809	-26.892	.183	.102	-.079	-19.100	-20.463	-20.229	-19.845	1.889	.094	.096	1.506
7500	2.50	-2.00	-19.481	-20.250	-19.797	-26.892	.127	.152	-.091	-19.197	-20.308	-20.187	-19.832	1.750	.124	.109	1.283
7500	3.00	-2.00	-19.519	-20.192	-19.771	-26.892	.057	.184	-.117	-19.301	-20.308	-20.141	-19.806	1.599	.144	.113	1.083
7500	3.50	-2.00	-19.566	-20.136	-19.740	-26.892	-.023	.210	-.148	-19.407	-20.242	-20.093	-19.774	1.445	.160	.115	.894
7500	4.00	-2.00	-19.629	-20.079	-19.706	-26.892	-.117	.232	-.182	-19.517	-20.177	-20.043	-19.739	1.285	.175	.115	.704
7500	4.50	-2.00	-19.696	-20.028	-19.674	-26.892	-.213	.252	-.214	-19.623	-20.118	-19.997	-19.707	1.133	.189	.114	.526
8000	2.00	-2.00	-19.801	-20.649	-20.057	-27.172	.174	.013	-.111	-19.402	-20.825	-20.538	-20.094	1.894	.036	.101	1.620
8000	2.50	-2.00	-19.780	-20.610	-20.047	-27.172	.170	.043	-.121	-19.460	-20.775	-20.515	-20.084	1.814	.048	.115	1.486
8000	3.00	-2.00	-19.797	-20.547	-20.039	-27.172	.116	.097	-.129	-19.549	-20.693	-20.475	-20.076	1.685	.081	.125	1.272
8000	3.50	-2.00	-19.835	-20.488	-20.025	-27.172	.044	.142	-.143	-19.649	-20.615	-20.433	-20.061	1.543	.107	.135	1.057
8000	4.00	-2.00	-19.886	-20.428	-19.996	-27.172	-.041	.174	-.172	-19.752	-20.543	-20.385	-20.032	1.392	.127	.140	.858
8000	4.50	-2.00	-19.946	-20.371	-19.964	-27.172	-.134	.198	-.204	-19.855	-20.476	-20.336	-19.999	1.240	.143	.141	.671
8500	2.00	-2.00	-20.136	-20.888	-20.256	-27.435	.090	-.027	-.175	-19.744	-21.073	-20.760	-20.294	1.775	.013	.099	1.551
8500	2.50	-2.00	-20.088	-20.877	-20.255	-27.435	.131	-.017	-.176	-19.756	-21.058	-20.764	-20.293	1.767	.008	.122	1.507
8500	3.00	-2.00	-20.060	-20.849	-20.246	-27.435	.142	.002	-.185	-19.791	-21.022	-20.754	-20.284	1.722	.009	.147	1.408
8500	3.50	-2.00	-20.050	-20.806	-20.229	-27.435	.127	.027	-.202	-19.842	-20.967	-20.733	-20.266	1.650	.012	.177	1.270
8500	4.00	-2.00	-20.061	-20.752	-20.203	-27.435	.084	.055	-.228	-19.906	-20.898	-20.700	-20.240	1.553	.018	.208	1.099
8500	4.50	-2.00	-20.089	-20.686	-20.167	-27.435	.014	.085	-.264	-19.979	-20.816	-20.655	-20.203	1.435	.027	.235	.909
9000	2.00	-2.00	-20.446	-21.056	-20.412	-27.683	-.029	-.039	-.267	-20.097	-21.244	-20.919	-20.451	1.580	.011	.088	1.381
9000	2.50	-2.00	-20.395	-21.066	-20.420	-27.683	.030	-.042	-.259	-20.080	-21.235	-20.937	-20.459	1.616	.001	.106	1.402
9000	3.00	-2.00	-20.351	-21.055	-20.422	-27.683	.068	-.029	-.257	-20.089	-21.230	-20.943	-20.461	1.613	-.003	.131	1.355
9000	3.50	-2.00	-20.324	-21.030	-20.418	-27.683	.081	-.007	-.261	-20.116	-21.203	-20.938	-20.457	1.581	-.002	.161	1.262
9000	4.00	-2.00	-20.314	-20.990	-20.406	-27.683	.069	.020	-.273	-20.157	-21.150	-20.923	-20.445	1.525	0.000	.197	1.130
9000	4.50	-2.00	-20.323	-20.938	-20.384	-27.683	.028	.050	-.295	-20.209	-21.081	-20.896	-20.423	1.446	.006	.233	.967
9500	2.00	-2.00	-20.713	-21.193	-20.541	-27.918	-.136	-.046	-.373	-20.415	-21.381	-21.049	-20.580	1.392	.010	.081	1.209
9500	2.50	-2.00	-20.664	-21.214	-20.553	-27.918	-.071	-.056	-.361	-20.380	-21.407	-21.075	-20.593	1.434	-.003	.096	1.269
9500	3.00	-2.00	-20.619	-21.216	-20.561	-27.918	-.024	-.050	-.353	-20.373	-21.406	-21.089	-20.601	1.475	-.010	.117	1.259
9500	3.50	-2.00	-20.586	-21.203	-20.565	-27.918	.004	-.034	-.349	-20.386	-21.387	-21.095	-20.605	1.468	-.011	.144	1.203
9500	4.00	-2.00	-20.566	-21.179	-20.565	-27.918	.013	-.011	-.349	-20.411	-21.351	-21.094	-20.604	1.442	-.011	.178	1.107
9500	4.50	-2.00	-20.558	-21.142	-20.557	-27.918	-.001	.020	-.357	-20.446	-21.298	-21.084	-20.597	1.398	-.008	.219	.975
10000	2.00	-2.00	-20.951	-21.315	-20.657	-28.141	-.229	-.054	-.480	-20.700	-21.506	-21.167	-20.696	1.226	.008	.077	1.056
10000	2.50	-2.00	-20.899	-21.342	-20.670	-28.141	-.160	-.067	-.467	-20.649	-21.537	-21.196	-20.710	1.305	-.007	.090	1.139
10000	3.00	-2.00	-20.858	-21.348	-20.679	-28.141	-.114	-.064	-.458	-20.634	-21.542	-21.211	-20.719	1.336	-.013	.106	1.150
10000	3.50	-2.00	-20.822	-21.344	-20.686	-28.141	-.077	-.054	-.451	-20.633	-21.534	-21.223	-20.726	1.349	-.018	.130	1.123
10000	4.00	-2.00	-20.802	-21.326	-20.691	-28.141	-.066	-.030	-.446	-20.654	-21.507	-21.224	-20.732	1.359	-.014	.155	1.045
10000	4.50	-2.00	-20.784	-21.305	-20.693	-28.141	-.058	-.008	-.444	-20.675	-21.473	-21.230	-20.734	1.315	-.018	.199	.951

TABLE 5

B.

TEFF	LOG G	LOG A	U	B	V	BOL	U-B	B-V	BC	TEFF	LOG G	LOG A	U	B	V	BOL	U-B	B-V	BC	
5500	0.00	0.00	-17.278	-18.216	-18.379	-25.545	.539	.752	-.180	8500	1.00	0.00	-20.567	-20.815	-20.285	-27.435	-.186	.059	-.164	
5500	.50	0.00	-17.364	-18.230	-18.367	-25.545	.466	.725	-.192	8500	1.50	0.00	-20.547	-20.923	-20.330	-27.435	-.059	-.004	-.119	
5500	1.00	0.00	-17.448	-18.242	-18.354	-25.545	.392	.701	-.205	8500	2.00	0.00	-20.506	-20.944	-20.339	-27.435	.004	-.017	-.110	
5500	1.50	0.00	-17.518	-18.248	-18.341	-25.545	.326	.682	-.218	8500	2.50	0.00	-20.452	-20.937	-20.344	-27.435	.052	-.005	-.105	
5500	2.00	0.00	-17.589	-18.253	-18.330	-25.545	.259	.665	-.229	8500	3.00	0.00	-20.400	-20.913	-20.344	-27.435	.082	.019	-.105	
5500	2.50	0.00	-17.632	-18.246	-18.312	-25.545	.188	.649	-.247	8500	3.50	0.00	-20.355	-20.877	-20.339	-27.435	.093	.051	-.110	
5500	3.00	0.00	-17.666	-18.249	-18.309	-25.545	.117	.635	-.250	8500	4.00	0.00	-20.322	-20.830	-20.328	-27.435	.080	.086	-.121	
5500	3.50	0.00	-17.670	-18.241	-18.302	-25.545	.045	.649	-.257	8500	4.50	0.00	-20.309	-20.777	-20.311	-27.435	.043	.122	-.138	
5500	4.00	0.00	-17.657	-18.233	-18.298	-25.545	.170	.654	-.261	9000	1.50	0.00	-20.819	-21.080	-20.478	-27.683	-.175	-.013	-.219	
5500	4.50	0.00	-17.630	-18.226	-18.297	-25.545	.191	.660	-.262	9000	2.00	0.00	-20.783	-21.127	-20.498	-27.683	-.092	-.040	-.199	
5770	4.44	0.00	-18.074	-18.553	-18.553	-25.753	.071	.588	-.214	9000	2.50	0.00	-20.737	-21.134	-20.505	-27.683	-.038	-.041	-.192	
6000	.50	0.00	-18.161	-18.913	-18.859	-25.923	.343	.534	-.078	9000	3.00	0.00	-20.683	-21.122	-20.510	-27.683	.006	-.024	-.187	
6000	1.00	0.00	-18.198	-18.903	-18.843	-25.923	.294	.529	-.094	9000	3.50	0.00	-20.635	-21.098	-20.511	-27.683	.031	.002	-.186	
6000	1.50	0.00	-18.249	-18.894	-18.828	-25.923	.234	.523	-.109	9000	4.00	0.00	-20.592	-21.063	-20.509	-27.683	.041	.034	-.188	
6000	2.00	0.00	-18.293	-18.881	-18.812	-25.923	.177	.520	-.125	9000	4.50	0.00	-20.564	-21.019	-20.502	-27.683	.027	.071	-.195	
6000	2.50	0.00	-18.328	-18.862	-18.794	-25.923	.123	.520	-.143	9400	3.90	0.00	-20.796	-21.221	-20.627	-27.872	-.006	-.006	-.259	
6000	3.00	0.00	-18.361	-18.847	-18.779	-25.923	.074	.521	-.158	9400	3.95	0.00	-20.792	-21.218	-20.627	-27.872	-.005	-.003	-.259	
6000	3.50	0.00	-18.383	-18.830	-18.766	-25.923	.036	.524	-.171	9400	4.00	0.00	-20.787	-21.215	-20.627	-27.872	-.003	0.000	-.259	
6000	4.00	0.00	-18.394	-18.816	-18.757	-25.923	.010	.529	-.180	9500	1.50	0.00	-21.059	-21.215	-20.606	-27.918	-.280	-.021	-.326	
6000	4.50	0.00	-18.392	-18.803	-18.751	-25.923	0.000	.536	-.186	9500	2.00	0.00	-21.024	-21.276	-20.634	-27.918	-.184	-.053	-.298	
6500	1.00	0.00	-18.819	-19.480	-19.260	-26.270	.243	.349	-.024	9500	2.50	0.00	-20.981	-21.294	-20.644	-27.918	-.122	-.063	-.288	
6500	1.50	0.00	-18.829	-19.455	-19.245	-26.270	.208	.379	-.039	9500	3.00	0.00	-20.930	-21.291	-20.648	-27.918	-.073	-.055	-.284	
6500	2.00	0.00	-18.843	-19.426	-19.225	-26.270	.165	.388	-.059	9500	3.50	0.00	-20.879	-21.275	-20.652	-27.918	-.037	-.035	-.280	
6500	2.50	0.00	-18.868	-19.399	-19.207	-26.270	.114	.396	-.077	9500	3.90	0.00	-20.843	-21.256	-20.654	-27.918	-.019	-.013	-.278	
6500	3.00	0.00	-18.896	-19.371	-19.188	-26.270	.058	.405	-.096	9500	4.00	0.00	-20.832	-21.249	-20.654	-27.918	-.015	-.007	-.278	
6500	3.50	0.00	-18.924	-19.343	-19.169	-26.270	.002	.415	-.115	9500	4.50	0.00	-20.795	-21.213	-20.653	-27.918	-.011	.028	-.279	
6500	4.00	0.00	-18.949	-19.317	-19.153	-26.270	-.049	.425	-.131	10000	1.50	0.00	-21.277	-21.340	-20.723	-28.141	-.373	-.029	-.432	
6500	4.50	0.00	-18.967	-19.295	-19.141	-26.270	-.088	.435	-.143	10000	2.00	0.00	-21.238	-21.409	-20.757	-28.141	-.266	-.064	-.398	
7000	1.00	0.00	-19.372	-20.000	-19.606	-26.592	.203	.193	.000	10000	2.50	0.00	-21.194	-21.432	-20.767	-28.141	-.200	-.076	-.388	
7000	1.50	0.00	-19.331	-19.947	-19.602	-26.592	.193	.243	-.004	10000	3.00	0.00	-21.148	-21.434	-20.771	-28.141	-.150	-.074	-.384	
7000	2.00	0.00	-19.319	-19.909	-19.588	-26.592	.168	.267	-.018	10000	3.50	0.00	-21.098	-21.423	-20.774	-28.141	-.109	-.061	-.381	
7000	2.50	0.00	-19.321	-19.870	-19.569	-26.592	.128	.287	-.037	10000	4.00	0.00	-21.050	-21.404	-20.777	-28.141	-.079	-.039	-.378	
7000	3.00	0.00	-19.333	-19.832	-19.548	-26.592	.078	.304	-.058	10000	4.50	0.00	-21.007	-21.375	-20.779	-28.141	-.063	-.008	-.376	
7000	3.50	0.00	-19.354	-19.794	-19.526	-26.592	.020	.320	-.080	10500	4.00	0.00	-21.247	-21.538	-20.887	-28.353	-.143	-.063	-.480	
7000	4.00	0.00	-19.380	-19.758	-19.505	-26.592	-.042	.335	-.101	11000	2.00	0.00	-21.608	-21.640	-20.970	-28.555	-.406	-.082	-.599	
7000	4.50	0.00	-19.406	-19.724	-19.485	-26.592	-.101	.349	-.121	11000	2.50	0.00	-21.564	-21.668	-20.982	-28.555	-.334	-.097	-.587	
7500	1.00	0.00	-19.861	-20.410	-19.900	-26.892	.119	.078	-.006	11000	3.00	0.00	-21.518	-21.673	-20.985	-28.555	-.282	-.100	-.584	
7500	1.50	0.00	-19.810	-20.396	-19.896	-26.892	.156	.089	-.010	11000	3.50	0.00	-21.470	-21.668	-20.986	-28.555	-.239	-.094	-.583	
7500	2.00	0.00	-19.740	-20.355	-19.889	-26.892	.167	.122	-.017	11000	4.00	0.00	-21.425	-21.655	-20.987	-28.555	-.205	-.080	-.582	
7500	2.50	0.00	-19.727	-20.294	-19.882	-26.892	.141	.176	-.024	11000	4.50	0.00	-21.383	-21.635	-20.988	-28.555	-.181	-.059	-.581	
7500	3.00	0.00	-19.717	-20.243	-19.867	-26.892	.101	.212	-.039	11500	4.00	0.00	-21.589	-21.761	-21.080	-28.748	-.264	-.093	-.682	
7500	3.50	0.00	-19.721	-20.197	-19.845	-26.892	.052	.237	-.061	12000	2.00	0.00	-21.914	-21.837	-21.150	-28.933	-.516	-.099	-.797	
7500	4.00	0.00	-19.736	-20.150	-19.820	-26.892	-.009	.258	-.086	12000	2.50	0.00	-21.872	-21.868	-21.164	-28.933	-.443	-.115	-.783	
7500	4.50	0.00	-19.760	-20.107	-19.796	-26.892	-.074	.277	-.110	12000	3.00	0.00	-21.828	-21.874	-21.167	-28.933	-.392	-.119	-.780	
8000	1.00	0.00	-20.256	-20.675	-20.135	-27.172	-.013	.049	-.051	12000	3.50	0.00	-21.783	-21.870	-21.167	-28.933	-.351	-.115	-.780	
8000	1.50	0.00	-20.220	-20.710	-20.142	-27.172	.058	.020	-.044	12000	4.00	0.00	-21.740	-21.858	-21.166	-28.933	-.318	-.104	-.781	
8000	2.00	0.00	-20.164	-20.700	-20.142	-27.172	.139	.031	-.059	12000	4.50	0.00	-21.700	-21.842	-21.166	-28.933	-.293	-.088	-.781	
8000	2.50	0.00	-20.090	-20.658	-20.127	-27.172	.109	.037	-.059	12500	4.00	0.00	-21.878	-21.949	-21.247	-29.110	-.366	-.114	-.877	
8000	3.00	0.00	-20.071	-20.621	-20.121	-27.172	.121	.039	-.054											
8000	3.50	0.00	-20.052	-20.556	-20.121	-27.172	.077	.153	-.065											
8000	4.00	0.00	-20.052	-20.501	-20.101	-27.172	.024	.188	-.085											
8000	4.50	0.00	-20.066	-20.449	-20.075	-27.172	-.041	.214	-.111											

TABLE 5B—Continued

TEFF	LOG G	LOG A	U	B	V	BOL	U-B	B-V	BC	TEFF	LOG G	LOG A	U	B	V	BOL	U-B	B-V	BC	
13000	2.00	0.00	-22.176	-22.010	-21.308	-29.280	-.605	-.114	-.986	30000	3.50	0.00	-24.450	-23.831	-22.962	-32.912	-1.065	-.281	-2.964	
13000	2.50	0.00	-22.133	-22.043	-21.322	-29.280	-.529	-.132	-.972	30000	4.00	0.00	-24.376	-23.791	-22.916	-32.912	-1.030	-.286	-3.010	
13000	3.00	0.00	-22.089	-22.048	-21.324	-29.280	-.480	-.136	-.970	30000	4.50	0.00	-24.317	-23.748	-22.878	-32.912	-1.014	-.282	-3.048	
13000	3.50	0.00	-22.047	-22.044	-21.323	-29.280	-.441	-.132	-.971	30000	5.00	0.00	-24.279	-23.720	-22.856	-32.912	-1.004	-.275	-3.070	
13000	4.00	0.00	-22.007	-22.034	-21.322	-29.280	-.411	-.123	-.972	35000	3.50	0.00	-24.766	-24.089	-23.220	-33.582	-1.122	-.281	-3.376	
13000	4.50	0.00	-21.970	-22.018	-21.321	-29.280	-.388	-.109	-.973	35000	4.00	0.00	-24.777	-24.122	-23.235	-33.582	-1.102	-.298	-3.361	
14000	2.00	0.00	-22.412	-22.168	-21.453	-29.602	-.683	-.127	-1.163	35000	4.50	0.00	-24.746	-24.106	-23.241	-33.582	-1.086	-.304	-3.382	
14000	2.50	0.00	-22.362	-22.200	-21.464	-29.602	-.601	-.148	-1.152	35000	5.00	0.00	-24.713	-24.082	-23.192	-33.582	-1.076	-.302	-3.404	
14000	3.00	0.00	-22.316	-22.204	-21.464	-29.602	-.552	-.152	-1.152	40000	4.00	0.00	-25.990	-24.305	-23.412	-34.162	-1.131	-.305	-3.764	
14000	3.50	0.00	-22.274	-22.198	-21.461	-29.602	-.515	-.149	-1.155	40000	4.50	0.00	-25.001	-24.324	-23.462	-34.162	-1.124	-.311	-3.752	
14000	4.00	0.00	-22.237	-22.188	-21.460	-29.602	-.487	-.140	-1.154	40000	5.00	0.00	-25.002	-24.328	-23.428	-34.162	-1.120	-.312	-3.748	
14000	4.50	0.00	-22.202	-22.173	-21.458	-29.602	-.466	-.127	-1.158	45000	4.50	0.00	-25.158	-24.463	-23.557	-34.673	-1.141	-.318	-4.130	
15000	2.00	0.00	-22.630	-22.311	-21.586	-29.902	-.759	-.136	-1.330	45000	5.00	0.00	-25.163	-24.471	-23.563	-34.673	-1.139	-.320	-4.124	
15000	2.50	0.00	-22.570	-22.347	-21.597	-29.902	-.664	-.162	-1.319	50000	4.50	0.00	-25.292	-24.583	-23.671	-35.131	-1.153	-.324	-4.474	
15000	3.00	0.00	-22.519	-22.346	-21.591	-29.902	-.613	-.167	-1.325	50000	5.00	0.00	-25.290	-24.587	-23.673	-35.131	-1.151	-.326	-4.472	
15000	3.50	0.00	-22.476	-22.338	-21.586	-29.902	-.577	-.164	-1.330	5500	2.00	1.00	-17.814	-18.299	-18.294	-25.545	.074	.583	-.265	
15000	4.00	0.00	-22.439	-22.327	-21.584	-29.902	-.551	-.155	-1.332	5500	2.50	1.00	-17.853	-18.286	-18.281	-25.545	.021	.583	-.278	
15000	4.50	0.00	-22.407	-22.313	-21.582	-29.902	-.532	-.143	-1.334	5500	3.00	1.00	-17.876	-18.272	-18.271	-25.545	-.015	.587	-.288	
16000	2.00	0.00	-22.836	-22.440	-21.711	-30.182	-.837	-.141	-1.485	5500	3.50	1.00	-17.883	-18.258	-18.264	-25.545	-.035	.594	-.295	
16000	2.50	0.00	-22.765	-22.484	-21.722	-30.182	-.722	-.174	-1.474	5500	4.00	1.00	-17.879	-18.248	-18.261	-25.545	-.042	.601	-.298	
16000	3.00	0.00	-22.706	-22.480	-21.711	-30.182	-.667	-.180	-1.485	5500	4.50	1.00	-17.867	-18.239	-18.259	-25.545	-.038	.608	-.300	
16000	3.50	0.00	-22.659	-22.468	-21.703	-30.182	-.631	-.177	-1.493	6000	2.00	1.00	-18.446	-18.912	-18.764	-25.923	.048	.441	-.173	
16000	4.00	0.00	-22.622	-22.455	-21.698	-30.182	-.606	-.169	-1.498	6000	2.50	1.00	-18.477	-18.882	-18.743	-25.923	-.012	.449	-.194	
16000	4.50	0.00	-22.590	-22.440	-21.694	-30.182	-.588	-.157	-1.502	6000	3.00	1.00	-18.505	-18.853	-18.723	-25.923	-.069	.459	-.214	
17000	2.00	0.00	-23.030	-22.548	-21.822	-30.445	-.923	-.138	-1.637	6000	3.50	1.00	-18.525	-18.827	-18.709	-25.923	-.115	.470	-.228	
17000	2.50	0.00	-22.951	-22.615	-21.842	-30.445	-.778	-.184	-1.617	6000	4.00	1.00	-18.537	-18.806	-18.701	-25.923	-.146	.483	-.236	
17000	3.00	0.00	-22.882	-22.607	-21.826	-30.445	-.717	-.193	-1.633	6000	4.50	1.00	-18.539	-18.790	-18.696	-25.923	-.164	.494	-.241	
17000	3.50	0.00	-22.830	-22.591	-21.812	-30.445	-.679	-.190	-1.647	6500	2.00	1.00	-18.945	-19.443	-19.178	-26.270	.076	.323	-.106	
17000	4.00	0.00	-22.789	-22.574	-21.803	-30.445	-.655	-.182	-1.656	6500	2.50	1.00	-18.962	-19.403	-19.153	-26.270	.020	.338	-.131	
17000	4.50	0.00	-22.757	-22.559	-21.800	-30.445	-.637	-.171	-1.659	6500	3.00	1.00	-18.984	-19.363	-19.127	-26.270	-.043	.353	-.157	
18000	2.50	0.00	-23.127	-22.736	-21.957	-30.694	-.832	-.191	-1.751	6500	3.50	1.00	-19.010	-19.324	-19.103	-26.270	-.107	.368	-.181	
18000	3.00	0.00	-23.049	-22.728	-21.936	-30.694	-.763	-.204	-1.772	6500	4.00	1.00	-19.036	-19.291	-19.084	-26.270	-.165	.382	-.200	
18000	3.50	0.00	-22.990	-22.708	-21.917	-30.694	-.724	-.202	-1.791	6500	4.50	1.00	-19.055	-19.265	-19.071	-26.270	-.210	.395	-.213	
18000	4.00	0.00	-22.946	-22.689	-21.906	-30.694	-.698	-.195	-1.802	7000	2.00	1.00	-19.376	-19.913	-19.545	-26.592	.112	.219	-.061	
18000	4.50	0.00	-22.912	-22.670	-21.899	-30.694	-.681	-.184	-1.809	7000	2.50	1.00	-19.372	-19.863	-19.520	-26.592	.067	.245	-.086	
20000	2.50	0.00	-23.458	-22.965	-22.177	-31.151	-.936	-.199	-1.988	7000	3.00	1.00	-19.379	-19.815	-19.492	-26.592	.102	.266	-.114	
20000	3.00	0.00	-23.363	-22.957	-22.148	-31.151	-.849	-.221	-2.017	7000	3.50	1.00	-19.398	-19.768	-19.464	-26.592	.054	.284	-.142	
20000	3.50	0.00	-23.290	-22.929	-22.118	-31.151	-.803	-.223	-2.047	7000	4.00	1.00	-19.423	-19.723	-19.436	-26.592	-.122	.301	-.170	
20000	4.00	0.00	-23.237	-22.903	-22.098	-31.151	-.776	-.217	-2.067	7000	4.50	1.00	-19.452	-19.685	-19.413	-26.592	-.190	.317	-.193	
20000	4.50	0.00	-23.196	-22.879	-22.084	-31.151	-.758	-.207	-2.091	7500	2.00	1.00	-19.779	-20.340	-19.852	-26.892	.132	.100	-.054	
22500	3.00	0.00	-23.716	-23.216	-22.393	-31.663	-.943	-.235	-2.284	7500	2.50	1.00	-19.744	-20.275	-19.841	-26.892	.104	.154	-.065	
22500	3.50	0.00	-23.632	-23.185	-22.355	-31.663	-.891	-.241	-2.322	7500	3.00	1.00	-19.732	-20.220	-19.818	-26.892	.061	.186	-.088	
22500	4.00	0.00	-23.568	-23.151	-22.324	-31.663	-.860	-.238	-2.353	7500	3.50	1.00	-19.733	-20.166	-19.789	-26.892	.007	.212	-.117	
22500	4.50	0.00	-23.520	-23.121	-22.302	-31.663	-.840	-.231	-2.375	7500	4.00	1.00	-19.748	-20.113	-19.758	-26.892	-.060	.234	-.148	
25000	3.00	0.00	-24.019	-23.448	-22.612	-32.120	-1.015	-.248	-2.522	7500	4.50	1.00	-19.773	-20.064	-19.729	-26.892	-.133	.253	-.177	
25000	3.50	0.00	-23.930	-23.412	-22.567	-32.120	-.962	-.257	-2.557											
25000	4.00	0.00	-23.866	-23.379	-22.535	-32.120	-.930	-.255	-2.599											
25000	4.50	0.00	-23.813	-23.344	-22.506	-32.120	-.912	-.250	-2.628											
25000	5.00	0.00	-23.771	-23.316	-22.486	-32.120	-.898	-.241	-2.648											

TABLE 5B—Continued

TEFF	LOG G	LOG A	U	B	V	BOL	U-B	B-V	BC	TEFF	LOG G	LOG A	U	B	V	BOL	U-B	B-V	BC
8000	2.00	-1.00	-20.147	-20.676	-20.101	-27.172	.096	.013	-.085	7000	2.00	-2.00	-19.397	-19.913	-19.522	-26.592	.089	.198	-.084
8000	2.50	-1.00	-20.093	-20.640	-20.093	-27.172	.116	.041	-.093	7000	2.50	-2.00	-19.387	-19.850	-19.491	-26.592	.037	.230	-.115
8000	3.00	-1.00	-20.056	-20.581	-20.085	-27.172	.096	.092	-.101	7000	3.00	-2.00	-19.337	-19.797	-19.460	-26.592	.021	.252	-.146
8000	3.50	-1.00	-20.040	-20.519	-20.072	-27.172	.052	.140	-.114	7000	3.50	-2.00	-19.410	-19.744	-19.427	-26.592	.091	.271	-.179
8000	4.00	-1.00	-20.040	-20.462	-20.045	-27.172	.005	.172	-.151	7000	4.00	-2.00	-19.436	-19.695	-19.396	-26.592	.165	.289	-.210
8000	4.50	-1.00	-20.055	-20.405	-20.015	-27.172	.075	.198	-.171	7000	4.50	-2.00	-19.467	-19.655	-19.371	-26.592	.236	.305	-.235
8500	2.00	-1.00	-20.469	-20.919	-20.300	-27.435	.016	-.031	-.149	7500	2.00	-2.00	-19.775	-20.323	-19.829	-26.892	.118	.094	-.077
8500	2.50	-1.00	-20.408	-20.802	-20.300	-27.435	.067	-.020	-.149	7500	2.50	-2.00	-19.742	-20.258	-19.815	-26.892	.088	.145	-.091
8500	3.00	-1.00	-20.353	-20.882	-20.294	-27.435	.098	.001	-.155	7500	3.00	-2.00	-19.730	-20.199	-19.789	-26.892	.042	.177	-.117
8500	3.50	-1.00	-20.305	-20.842	-20.281	-27.435	.108	.027	-.168	7500	3.50	-2.00	-19.730	-20.142	-19.756	-26.892	.015	.203	-.150
8500	4.00	-1.00	-20.271	-20.791	-20.260	-27.435	.093	.057	-.189	7500	4.00	-2.00	-19.746	-20.085	-19.722	-26.892	.087	.226	-.184
8500	4.50	-1.00	-20.253	-20.732	-20.231	-27.435	.053	.088	-.218	7500	4.50	-2.00	-19.772	-20.033	-19.690	-26.892	.165	.245	-.216
9000	2.00	-1.00	-20.741	-21.090	-20.457	-27.683	.086	.045	-.240	8000	2.00	-2.00	-20.132	-20.661	-20.079	-27.172	.097	.006	-.107
9000	2.50	-1.00	-20.690	-21.088	-20.464	-27.683	.027	-.045	-.233	8000	2.50	-2.00	-20.076	-20.620	-20.069	-27.172	.113	.037	-.117
9000	3.00	-1.00	-20.630	-21.087	-20.467	-27.683	.024	-.032	-.230	8000	3.00	-2.00	-20.040	-20.556	-20.059	-27.172	.087	.092	-.127
9000	3.50	-1.00	-20.574	-21.063	-20.464	-27.683	.057	-.011	-.233	8000	3.50	-2.00	-20.027	-20.495	-20.044	-27.172	.041	.137	-.142
9000	4.00	-1.00	-20.525	-21.024	-20.454	-27.683	.069	.019	-.243	8000	4.00	-2.00	-20.029	-20.434	-20.014	-27.172	.021	.168	-.172
9000	4.50	-1.00	-20.493	-20.974	-20.437	-27.683	.054	.051	-.260	8000	4.50	-2.00	-20.045	-20.376	-19.981	-27.172	.094	.193	-.205
9500	2.00	-1.00	-20.973	-21.231	-20.589	-27.918	.179	.054	-.343	8500	2.00	-2.00	-20.448	-20.901	-20.279	-27.435	.018	-.034	-.170
9500	2.50	-1.00	-20.931	-21.252	-20.601	-27.918	.115	.063	-.331	8500	2.50	-2.00	-20.385	-20.890	-20.278	-27.435	.071	-.023	-.171
9500	3.00	-1.00	-20.878	-21.252	-20.607	-27.918	.061	.056	-.325	8500	3.00	-2.00	-20.327	-20.860	-20.269	-27.435	.101	-.002	-.180
9500	3.50	-1.00	-20.823	-21.237	-20.610	-27.918	.019	.038	-.322	8500	3.50	-2.00	-20.277	-20.816	-20.251	-27.435	.109	.024	-.198
9500	4.00	-1.00	-20.770	-21.211	-20.609	-27.918	.010	.013	-.323	8500	4.00	-2.00	-20.240	-20.759	-20.225	-27.435	.091	.054	-.224
9500	4.50	-1.00	-20.728	-21.172	-20.604	-27.918	.015	.020	-.328	8500	4.50	-2.00	-20.221	-20.693	-20.188	-27.435	.045	.084	-.261
10000	2.00	-1.00	-21.177	-21.357	-20.706	-28.141	.257	.062	-.449	9000	2.00	-2.00	-20.717	-21.070	-20.436	-27.683	.083	-.046	-.261
10000	2.50	-1.00	-21.139	-21.382	-20.719	-28.141	.193	.075	-.436	9000	2.50	-2.00	-20.665	-21.030	-20.444	-27.683	.020	-.048	-.253
10000	3.00	-1.00	-21.094	-21.387	-20.727	-28.141	.143	.072	-.428	9000	3.00	-2.00	-20.604	-21.068	-20.446	-27.683	.030	-.034	-.251
10000	3.50	-1.00	-21.043	-21.381	-20.732	-28.141	.096	.060	-.423	9000	3.50	-2.00	-20.547	-21.040	-20.441	-27.683	.062	-.011	-.256
10000	4.00	-1.00	-20.994	-21.360	-20.736	-28.141	.067	.036	-.419	9000	4.00	-2.00	-20.496	-20.999	-20.429	-27.683	.073	.018	-.268
10000	4.50	-1.00	-20.944	-21.336	-20.737	-28.141	.039	.010	-.418	9000	4.50	-2.00	-20.462	-20.945	-20.406	-27.683	.056	.050	-.291
5500	2.00	-2.00	-17.929	-18.317	-18.267	-25.545	.027	.539	-.292	9500	2.00	-2.00	-20.942	-21.207	-20.565	-27.918	.171	-.054	-.367
5500	2.50	-2.00	-17.963	-18.297	-18.253	-25.545	.082	.544	-.306	9500	2.50	-2.00	-20.901	-21.229	-20.578	-27.918	.108	-.063	-.354
5500	3.00	-2.00	-17.982	-18.278	-18.244	-25.545	.118	.554	-.315	9500	3.00	-2.00	-20.848	-21.229	-20.585	-27.918	.053	-.056	-.347
5500	3.50	-2.00	-17.986	-18.262	-18.239	-25.545	.138	.565	-.320	9500	3.50	-2.00	-20.793	-21.216	-20.589	-27.918	.011	-.038	-.343
5500	4.00	-2.00	-17.982	-18.249	-18.238	-25.545	.146	.576	-.321	9500	4.00	-2.00	-20.740	-21.189	-20.588	-27.918	.018	-.013	-.344
5500	4.50	-2.00	-17.980	-18.240	-18.235	-25.545	.153	.582	-.324	9500	4.50	-2.00	-20.695	-21.150	-20.581	-27.918	.026	.019	-.351
6000	2.00	-2.00	-18.516	-18.916	-18.734	-25.923	.021	.406	-.203	10000	2.00	-2.00	-21.140	-21.330	-20.681	-28.141	.246	-.061	-.474
6000	2.50	-2.00	-18.546	-18.880	-18.709	-25.923	.086	.417	-.228	10000	2.50	-2.00	-21.102	-21.357	-20.695	-28.141	.182	-.074	-.460
6000	3.00	-2.00	-18.572	-18.848	-18.689	-25.923	.144	.430	-.248	10000	3.00	-2.00	-21.058	-21.362	-20.704	-28.141	.132	-.070	-.451
6000	3.50	-2.00	-18.593	-18.817	-18.672	-25.923	.196	.443	-.265	10000	3.50	-2.00	-21.008	-21.357	-20.710	-28.141	.084	-.059	-.445
6000	4.00	-2.00	-18.605	-18.795	-18.664	-25.923	.229	.458	-.273	10000	4.00	-2.00	-20.961	-21.337	-20.715	-28.141	.056	-.034	-.440
6000	4.50	-2.00	-18.610	-18.779	-18.660	-25.923	.249	.470	-.277	10000	4.50	-2.00	-20.913	-21.314	-20.717	-28.141	.028	-.009	-.438
6500	2.00	-2.00	-18.983	-19.439	-19.150	-26.270	.033	.299	-.134										
6500	2.50	-2.00	-18.997	-19.392	-19.120	-26.270	.028	.316	-.164										
6500	3.00	-2.00	-19.019	-19.346	-19.090	-26.270	.096	.333	-.194										
6500	3.50	-2.00	-19.045	-19.303	-19.064	-26.270	.164	.349	-.220										
6500	4.00	-2.00	-19.072	-19.268	-19.043	-26.270	.226	.364	-.241										
6500	4.50	-2.00	-19.093	-19.241	-19.030	-26.270	.273	.377	-.254										

TABLE 6
FLUXES AND BLOCKING FRACTIONS

Table with 11 columns: LAMBDA (NM), and 10 columns of flux values for different blocking fractions (0.00, 0.00; .50, 0.00; 1.00, 0.00; 1.50, 0.00; 2.00, 0.00; 2.50, 0.00; 3.00, 0.00; 3.50, 0.00; 4.00, 0.00). Rows list various wavelengths from 22.9 to 206.3 nm.

Table with columns: LAMBDA (NM), 35000, 35000, 35000, 35000, 40000, 40000, 40000, 45000, 45000. Rows contain numerical data for various wavelengths.

Table with 10 columns: LAMBDA (NM), 7500 (2.50,-1.00), 7500 (3.00,-1.00), 7500 (3.50,-1.00), 7500 (4.00,-1.00), 7500 (4.50,-1.00), 8000 (2.00,-1.00), 8000 (2.50,-1.00), 8000 (3.00,-1.00), 8000 (3.50,-1.00). The table contains numerical data for various wavelengths and flux levels, grouped into several sections.

LAMBDA (NM)	8500 2.50,-2.00	8500 3.00,-2.00	8500 3.50,-2.00	8500 4.00,-2.00	8500 4.50,-2.00	9000 2.00,-2.00	9000 2.50,-2.00	9000 3.00,-2.00	9000 3.50,-2.00
22.9	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
23.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
24.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
25.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
25.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
26.0	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
26.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
27.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
28.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
29.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
30.1	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
30.9	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
32.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
34.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
35.1	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
35.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
36.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
37.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
38.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
40.0	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
41.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
42.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
44.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
47.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
49.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
50.6	-6.5742 000	-6.3871 000	-6.2140 000	-6.0536 000	-5.9408 000	-5.8240 000	-5.7656 000	-5.1928 000	-5.0984 000
51.6	-6.2075 000	-6.0241 000	-5.8544 000	-5.6972 000	-5.5866 000	-5.4982 000	-5.4253 000	-4.8540 000	-4.7614 000
54.0	-5.3861 000	-5.2108 000	-5.0487 000	-4.8986 000	-4.7930 000	-4.7176 000	-4.6628 000	-4.0948 000	-4.0063 000
56.4	-4.6385 000	-4.4707 000	-4.3155 000	-4.1719 000	-4.0709 000	-3.9215 000	-3.8688 000	-3.4038 000	-3.3190 000
58.7	-3.9829 000	-3.8217 000	-3.6726 000	-3.5346 000	-3.4376 000	-3.3109 000	-3.2601 000	-2.7977 000	-2.7162 000
61.2	-3.3297 000	-3.1751 000	-3.0321 000	-2.8998 000	-2.8067 000	-2.7026 000	-2.6537 000	-2.1939 000	-2.1156 000
64.0	-2.6627 000	-2.5149 000	-2.3781 000	-2.2516 000	-2.1627 000	-2.0816 000	-2.0347 000	-1.5775 000	-1.5025 000
67.1	-1.9938 000	-1.8528 000	-1.7223 000	-1.6017 000	-1.5169 000	-1.4588 000	-1.4140 000	-9594 000	-8878 000
70.5	-1.3328 000	-1.1985 000	-1.0744 000	-9956 000	-8789 000	-8436 000	-8008 000	-3488 000	-2806 000
73.6	-.7875 000	-.6589 000	-.5400 000	-.4300 000	-.3528 000	-.2637 000	-.1048 000	.1546 000	.2200 000
77.0	-.2441 000	-.1212 000	-.0076 000	.0975 000	.1714 000	.2690 000	.4084 000	.6561 000	.7186 000
81.0	.3316 000	.4484 000	.5565 000	.6564 000	.7266 000	.7842 000	.8267 000	1.1871 000	1.2466 000
85.0	.8481 000	.9595 000	1.0625 000	1.1576 000	1.2245 000	1.2841 000	1.3199 000	1.6631 000	1.7198 000
89.0	1.3136 000	1.4200 000	1.5183 000	1.6092 000	1.6731 000	1.7263 000	1.7705 000	2.0918 000	2.1460 000
92.0	2.3740 998	2.3545 993	2.3418 987	2.3428 986	2.3429 992	3.12841000	3.06111000	3.01621000	2.98671000
94.0	2.9208 994	2.9097 973	2.9111 950	2.9183 942	2.9212 965	3.63891000	3.54581000	3.49441000	3.46711000
96.2	3.2201 987	3.2103 944	3.2138 895	3.2214 877	3.2244 926	4.20871000	3.90031000	3.81681000	3.77231000
98.7	3.5465 973	3.5362 882	3.5393 780	3.5478 738	3.5539 838	6.8049 890	6.0194 975	4.8222 997	4.2025 999
101.2	3.7079 960	3.6949 836	3.6976 703	3.7054 651	3.7104 776	6.6760 920	5.8209 984	4.6847 998	4.3165 999
103.7	3.8555 945	3.8431 785	3.8454 633	3.8527 579	3.8574 713	6.6870 920	5.8966 981	4.8616 997	4.4518 998
106.2	4.4390 795	4.0897 661	4.0875 466	4.1031 393	4.1167 544	7.5378 447	7.2162 611	6.7235 786	6.0917 910
108.7	4.8368 517	4.3701 441	4.2360 397	4.2525 330	4.2731 463	7.6442 310	7.4257 375	7.0958 495	6.6834 647
111.2	7.5709 518	7.4715 642	7.3087 774	7.0622 887	6.7258 955	8.0897 308	8.1229 356	8.1006 447	8.0182 574
113.7	7.5233 565	7.4056 687	7.2196 812	6.9502 910	6.5980 966	8.0817 327	8.1006 386	8.0639 484	7.9643 616
116.2	7.3639 695	7.1222 834	6.7767 931	6.3479 977	5.9145 993	8.0764 340	8.0449 457	7.9300 616	7.7176 778
118.7	6.5286 955	5.9598 988	5.4281 997	5.2025 998	5.1255 999	7.8120 642	7.5855 810	7.2058 926	6.6731 980
121.0	4.8389 999	4.8141 999	4.8032 999	4.7974 999	4.7900 999	5.9285 995	5.3986 999	5.2914 999	5.2403 999
122.9	5.2196 998	5.1217 998	5.0856 999	5.0641 999	5.0452 999	7.1398 925	6.4703 985	5.8019 997	5.5770 998
125.4	7.1940 875	6.8394 952	6.3993 985	5.9893 995	5.7426 997	8.0327 465	7.9078 647	7.6762 814	7.3398 922
128.5	7.8170 488	7.7056 649	7.5236 795	7.2673 899	6.9623 955	8.2264 177	8.2252 269	8.1769 407	8.0728 574
131.2	7.9429 325	7.9131 437	7.8456 570	7.7262 708	7.5545 823	8.2449 149	8.2695 190	8.2687 263	8.2387 369
133.7	8.0179 204	8.0163 287	7.9927 395	7.9363 523	7.8421 654	8.2805 080	8.3099 108	8.3224 158	8.3179 233
136.2	8.0231 197	8.0364 252	8.0368 327	8.0155 423	7.9667 534	8.2657 113	8.2979 127	8.3182 157	8.3273 206
138.7	8.0510 144	8.0714 185	8.0841 243	8.0813 322	8.0577 418	8.2785 086	8.3101 096	8.3333 116	8.3492 152
141.0	8.0612 122	8.0868 151	8.1085 193	8.1190 253	8.1137 331	8.2808 079	8.3122 083	8.3378 096	8.3586 120
143.3	8.0667 108	8.0930 133	8.1176 169	8.1337 220	8.1372 286	8.2845 068	8.3127 073	8.3373 085	8.3590 105
145.7	8.0755 093	8.1046 111	8.1339 140	8.1563 180	8.1681 234	8.2866 060	8.3139 062	8.3391 070	8.3632 086
148.2	8.0735 090	8.1028 106	8.1339 129	8.1601 162	8.1776 206	8.2851 056	8.3096 059	8.3339 066	8.3583 080
150.7	8.0897 047	8.1257 047	8.1672 047	8.2088 050	8.2479 054	8.2893 039	8.3140 036	8.3414 034	8.3715 034
153.2	8.0835 065	8.1233 061	8.1702 058	8.2184 055	8.2652 053	8.2782 057	8.3022 051	8.3304 047	8.3625 044
155.7	8.0466 131	8.0822 134	8.1257 137	8.1710 140	8.2147 144	8.2571 092	8.2762 093	8.3005 094	8.3295 097
158.2	8.0619 089	8.0972 091	8.1404 094	8.1854 097	8.2292 100	8.2642 067	8.2814 067	8.3051 068	8.3340 070
160.8	8.0678 063	8.1032 064	8.1470 065	8.1929 066	8.2376 067	8.2674 048	8.2834 047	8.3067 047	8.3357 047
163.5	8.0485 091	8.0841 090	8.1282 089	8.1746 089	8.2197 090	8.2485 076	8.2631 074	8.2861 073	8.3153 072
166.3	8.0196 136	8.0532 138	8.0957 140	8.1409 142	8.1847 145	8.2287 104	8.2404 104	8.2616 105	8.2894 107
168.8	8.0376 090	8.0723 090	8.1163 090	8.1631 090	8.2092 091	8.2383 073	8.2489 072	8.2701 072	8.2985 072
171.2	8.0254 103	8.0608 101	8.1056 099	8.1533 098	8.2005 096	8.2246 090	8.2355 086	8.2574 083	8.2867 081
173.7	8.0343 071	8.0691 070	8.1132 069	8.1607 068	8.2077 067	8.2319 062	8.2409 059	8.2620 056	8.2909 055
176.2	8.0307 066	8.0641 068	8.1069 069	8.1532 070	8.1991 072	8.2323 048	8.2385 048	8.2574 050	8.2844 051
178.7	8.0353 043	8.0699 042	8.1138 040	8.1613 039	8.2083 038	8.2309 038	8.2375 035	8.2576 033	8.2859 031
181.5	8.0120 079	8.0469 077	8.0910 075	8.1386 073	8.1855 073	8.2114 066	8.2179 061	8.2383 057	8.2667 055
184.0	8.0087 074	8.0423 074	8.0854 074	8.1324 073	8.1790 074	8.2085 060	8.2129 057	8.2317 056	8.2592 056
186.2	8.0127 055	8.0468 054	8.0900 052	8.1371 052	8.1840 052	8.2086 048	8.2135 043	8.2329 040	8.2608 038
189.2	8.0093 048	8.0432 047	8.0866 045	8.1341 043	8.1817 041	8.2062 038	8.2092 035	8.2278 033	8.2553 032
192.0	8.0089 036	8.0431 034	8.0865 031	8.1343 029	8.1822 026	8.2022 033	8.2051 029	8.2238 026	8.2516 023
194.0	8.0068 032	8.0395 032	8.0815 033	8.1278 034	8.1742 035	8.2009 026	8.2020 024	8.2194 024	8.2460 024
196.4	8.0063 023	8.0367 023							

LAMBDA (NM)	8500 2.50,-2.00		8500 3.00,-2.00		8500 3.50,-2.00		8500 4.00,-2.00		8500 4.50,-2.00		9000 2.00,-2.00		9000 2.50,-2.00		9000 3.00,-2.00		9000 3.50,-2.00	
	208.8	7.9749	045	8.0070	044	8.0482	044	8.0941	044	8.1409	044	8.1664	034	8.1655	032	8.1818	031	8.2077
211.2	7.9693	049	8.0009	050	8.0614	050	8.0867	051	8.1331	051	8.1620	034	8.1602	033	8.1759	033	8.2012	034
213.7	7.9542	074	7.9867	072	8.0282	070	8.0745	068	8.1222	066	8.1476	056	8.1467	052	8.1631	050	8.1892	049
216.2	7.9546	065	7.9862	065	8.0265	065	8.0717	065	8.1182	065	8.1453	051	8.1438	049	8.1597	047	8.1852	047
218.7	7.9576	057	7.9893	051	8.0296	050	8.0750	049	8.1217	048	8.1451	042	8.1435	039	8.1594	038	8.1849	036
221.2	7.9429	077	7.9744	076	8.0145	075	8.0596	074	8.1063	073	8.1306	064	8.1290	061	8.1447	060	8.1699	059
223.7	7.9451	065	7.9774	062	8.0183	059	8.0643	056	8.1119	052	8.1309	055	8.1300	050	8.1461	047	8.1720	044
226.2	7.9261	100	7.9572	099	7.9967	098	8.0413	097	8.0877	096	8.1141	082	8.1125	079	8.1279	078	8.1528	076
228.7	7.9388	067	7.9692	067	8.0079	067	8.0516	068	8.0970	068	8.1235	054	8.1213	052	8.1362	051	8.1606	050
231.2	7.9363	067	7.9666	067	8.0053	066	8.0490	066	8.0947	065	8.1208	052	8.1188	049	8.1336	048	8.1579	047
233.7	7.9194	097	7.9501	096	7.9889	095	8.0324	094	8.0774	094	8.1046	079	8.1029	075	8.1179	074	8.1421	072
236.2	7.9153	101	7.9458	100	7.9844	098	8.0279	097	8.0733	096	8.0973	087	8.0958	083	8.1108	081	8.1351	079
238.7	7.8982	132	7.9290	129	7.9677	126	8.0110	125	8.0560	124	8.0834	109	8.0825	104	8.0976	101	8.1220	099
241.2	7.9081	107	7.9384	105	7.9766	103	8.0195	101	8.0644	101	8.0897	089	8.0887	084	8.1036	081	8.1276	079
243.7	7.9132	093	7.9425	092	7.9799	090	8.0223	089	8.0671	088	8.0912	079	8.0895	076	8.1038	074	8.1273	072
246.2	7.9066	102	7.9352	102	7.9716	102	8.0131	102	8.0571	102	8.0853	086	8.0832	082	8.0970	081	8.1198	081
248.7	7.9048	102	7.9325	104	7.9680	105	8.0084	106	8.0512	108	8.0838	082	8.0809	081	8.0937	082	8.1157	082
250.6	7.9147	079	7.9424	080	7.9779	080	8.0183	081	8.0613	082	8.0905	064	8.0876	062	8.1005	062	8.1225	063
251.9	7.9085	090	7.9345	094	7.9683	098	8.0070	102	8.0480	107	8.0890	064	8.0844	066	8.0956	069	8.1159	073
253.7	7.8839	138	7.9113	139	7.9464	139	7.9865	140	8.0292	141	8.0637	112	8.0613	110	8.0739	110	8.0956	111
256.2	7.9132	075	7.9407	074	7.9760	074	8.0161	074	8.0590	074	8.0854	061	8.0830	059	8.0959	058	8.1179	057
258.7	7.9123	073	7.9396	073	7.9744	073	8.0139	073	8.0558	074	8.0840	059	8.0813	057	8.0939	056	8.1154	056
261.2	7.9093	077	7.9364	076	7.9711	075	8.0104	075	8.0524	076	8.0797	062	8.0773	060	8.0899	059	8.1114	058
263.7	7.9196	051	7.9462	051	7.9803	051	8.0193	051	8.0610	051	8.0864	042	8.0837	040	8.0960	040	8.1171	039
266.2	7.9252	036	7.9515	036	7.9854	035	8.0242	035	8.0660	034	8.0902	028	8.0874	027	8.0994	026	8.1203	026
268.7	7.9229	038	7.9490	038	7.9826	037	8.0210	036	8.0626	036	8.0875	029	8.0847	028	8.0965	027	8.1171	027
271.2	7.9148	053	7.9404	053	7.9733	053	8.0112	053	8.0521	053	8.0804	039	8.0776	038	8.0891	038	8.1093	038
273.7	7.9068	068	7.9317	069	7.9637	070	8.0004	071	8.0399	074	8.0713	054	8.0684	053	8.0796	053	8.0993	054
276.2	7.9100	059	7.9349	059	7.9670	059	8.0039	059	8.0438	060	8.0724	047	8.0698	046	8.0810	045	8.1007	045
278.7	7.9063	064	7.9309	064	7.9623	065	7.9981	067	8.0364	070	8.0702	047	8.0674	046	8.0783	046	8.0975	046
281.2	7.9182	036	7.9424	036	7.9736	036	8.0093	037	8.0477	040	8.0785	024	8.0755	023	8.0862	023	8.1053	023
283.7	7.9146	041	7.9387	041	7.9699	040	8.0060	040	8.0453	040	8.0727	032	8.0701	031	8.0808	030	8.0999	030
286.2	7.9096	050	7.9332	050	7.9638	050	7.9992	050	8.0378	051	8.0676	039	8.0647	038	8.0752	037	8.0939	037
288.7	7.9148	036	7.9384	036	7.9690	035	8.0046	034	8.0435	033	8.0715	025	8.0687	024	8.0790	024	8.0975	024
291.2	7.9236	014	7.9468	014	7.9769	013	8.0118	013	8.0501	012	8.0769	008	8.0739	008	8.0840	008	8.1022	007
293.7	7.9146	032	7.9372	032	7.9667	032	8.0010	032	8.0386	033	8.0678	024	8.0649	024	8.0748	024	8.0926	024
296.2	7.9184	021	7.9405	022	7.9694	022	8.0031	023	8.0401	024	8.0703	014	8.0673	014	8.0768	014	8.0943	014
298.7	7.9193	017	7.9411	017	7.9697	018	8.0029	019	8.0396	020	8.0695	011	8.0664	011	8.0758	011	8.0931	012
301.2	7.9210	010	7.9421	012	7.9697	014	8.0020	016	8.0377	019	8.0708	004	8.0673	005	8.0762	006	8.0927	007
303.7	7.9218	006	7.9430	007	7.9708	008	8.0032	009	8.0390	010	8.0692	003	8.0660	003	8.0751	003	8.0918	004
306.2	7.9187	011	7.9397	011	7.9673	012	7.9995	013	8.0352	013	8.0660	005	8.0629	006	8.0717	006	8.0882	006
308.7	7.9166	013	7.9371	014	7.9641	015	7.9956	017	8.0305	018	8.0632	007	8.0600	008	8.0686	008	8.0847	009
311.2	7.9151	014	7.9358	014	7.9629	014	7.9947	014	8.0299	014	8.0605	009	8.0576	009	8.0663	009	8.0825	009
313.7	7.9157	010	7.9362	010	7.9631	010	7.9947	010	8.0297	009	8.0597	006	8.0568	006	8.0655	006	8.0815	006
316.2	7.9143	011	7.9345	011	7.9610	011	7.9922	011	8.0269	011	8.0575	007	8.0545	007	8.0629	007	8.0787	007
318.7	7.9104	018	7.9301	018	7.9560	018	7.9865	019	8.0204	020	8.0535	011	8.0505	011	8.0586	012	8.0741	012
321.2	7.9125	010	7.9321	010	7.9579	010	7.9882	011	8.0219	011	8.0539	006	8.0510	006	8.0591	006	8.0744	006
323.7	7.9087	016	7.9280	016	7.9534	017	7.9834	017	8.0167	017	8.0499	010	8.0468	011	8.0548	011	8.0698	011
326.2	7.9104	010	7.9297	010	7.9550	009	7.9848	009	8.0181	009	8.0502	005	8.0472	005	8.0551	005	8.0700	005
328.7	7.9105	007	7.9295	007	7.9545	006	7.9840	006	8.0169	006	8.0489	004	8.0459	004	8.0537	004	8.0685	003
331.2	7.9108	003	7.9295	003	7.9540	003	7.9831	004	8.0155	004	8.0477	002	8.0448	002	8.0524	002	8.0669	002
333.7	7.9055	013	7.9240	013	7.9483	013	7.9771	012	8.0093	012	8.0432	002	8.0402	008	8.0477	008	8.0619	008
336.2	7.9058	009	7.9240	009	7.9479	009	7.9763	009	8.0081	010	8.0419	006	8.0389	006	8.0463	006	8.0603	006
338.7	7.9053	008	7.9232	008	7.9468	008	7.9748	008	8.0061	009	8.0406	004	8.0377	004	8.0449	004	8.0587	004
341.2	7.9050	005	7.9226	006	7.9458	006	7.9733	007	8.0041	007	8.0391	003	8.0361	003	8.0432	003	8.0568	003
343.7	7.9046	004	7.9219	004	7.9448	004	7.9720	005	8.0024	006	8.0376	001	8.0347	001	8.0416	002	8.0550	002
346.2	7.9035	003	7.9207	003	7.9434	003	7.9704	004	8.0007	004	8.0356	001	8.0326	001	8.0396	001	8.0528	002
348.7	7.9019	003	7.9189	003	7.9413	004	7.9679	005	7.9977	005	8.0334	001	8.0305	001	8.0373	002	8.0503	002
351.2	7.9011	002	7.9178	003	7.9399	003	7.9662	004	7.9957	004	8.0316	001	8.0287	001	8.0353	001	8.0481	001
353.7	7.9003	001	7.9169	001	7.9388	001	7.9648	002	7.9941	002	8.0297	000	8.0268	000	8.0333	000	8.0460	001
356.2	7.8984	002	7.9147	003	7.9362	003	7.9617	004	7.9904	005	8.0274	001	8.0245	001	8.0309	001	8.0433	001
358.7	7.8968	003	7.9129	003	7.9342	003	7.9596	004	7.9880	005	8.0251	001	8.0222	001	8.0285	001	8.0408	001
361.2	7.8952	003	7.9110	003	7.9319	004	7.9568	005	7.9847	007	8.0230	001	8.0201	001	8.0262	001	8.0382	002
363.6	7.8936	003	7.9094	004	7.9302	004	7.9551	004	7.9831	005	8.0204	002						

LAMBDA (NM)	8500		8500		8500		8500		8500		9000		9000		9000		9000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	2.50,-2.00	3.00,-2.00	3.50,-2.00	4.00,-2.00	4.50,-2.00	2.00,-2.00	2.50,-2.00	3.00,-2.00	3.50,-2.00	2.00,-2.00	2.50,-2.00	3.00,-2.00	3.50,-2.00	2.00,-2.00	2.50,-2.00	3.00,-2.00	3.50,-2.00	2.00,-2.00	2.50,-2.00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
421.2	8.4286 001	8.4238 004	8.4136 006	8.3974 010	8.3749 015	8.4873 000	8.4994 000	8.5035 001	8.5009 004	8.4202 004	8.4153 007	8.4050 010	8.3888 014	8.3663 020	8.4802 001	8.4917 002	8.4956 002	8.4928 006	8.4851 007	8.4136 004	8.4083 007	8.3973 012	8.3801 018	8.3565 027	8.4736 001	8.4849 001	8.4880 003	8.4811 004	8.4752 013	8.4601 017	8.4571 008	8.4401 013	8.4368 001	8.4333 004	8.4244 011	8.4178 013	8.4092 018	8.4022 001	8.3951 003	8.3877 001	8.3801 004	8.3724 004	8.3669 001	8.3625 002	8.3571 011	8.3499 017	8.3429 002	8.3359 005	8.3289 008	8.3219 011	8.3149 014	8.3079 017	8.3009 020	8.2939 023	8.2869 026	8.2799 029	8.2729 032	8.2659 035	8.2589 038	8.2519 041	8.2449 044	8.2379 047	8.2309 050	8.2239 053	8.2169 056	8.2099 059	8.2029 062	8.1959 065	8.1889 068	8.1819 071	8.1749 074	8.1679 077	8.1609 080	8.1539 083	8.1469 086	8.1399 089	8.1329 092	8.1259 095	8.1189 098	8.1119 101	8.1049 104	8.0979 107	8.0909 110	8.0839 113	8.0769 116	8.0699 119	8.0629 122	8.0559 125	8.0489 128	8.0419 131	8.0349 134	8.0279 137	8.0209 140	8.0139 143	8.0069 146	8.0000 149	7.9930 152	7.9860 155	7.9790 158	7.9720 161	7.9650 164	7.9580 167	7.9510 170	7.9440 173	7.9370 176	7.9300 179	7.9230 182	7.9160 185	7.9090 188	7.9020 191	7.8950 194	7.8880 197	7.8810 200	7.8740 203	7.8670 206	7.8600 209	7.8530 212	7.8460 215	7.8390 218	7.8320 221	7.8250 224	7.8180 227	7.8110 230	7.8040 233	7.7970 236	7.7900 239	7.7830 242	7.7760 245	7.7690 248	7.7620 251	7.7550 254	7.7480 257	7.7410 260	7.7340 263	7.7270 266	7.7200 269	7.7130 272	7.7060 275	7.6990 278	7.6920 281	7.6850 284	7.6780 287	7.6710 290	7.6640 293	7.6570 296	7.6500 299	7.6430 302	7.6360 305	7.6290 308	7.6220 311	7.6150 314	7.6080 317	7.6010 320	7.5940 323	7.5870 326	7.5800 329	7.5730 332	7.5660 335	7.5590 338	7.5520 341	7.5450 344	7.5380 347	7.5310 350	7.5240 353	7.5170 356	7.5100 359	7.5030 362	7.4960 365	7.4890 368	7.4820 371	7.4750 374	7.4680 377	7.4610 380	7.4540 383	7.4470 386	7.4400 389	7.4330 392	7.4260 395	7.4190 398	7.4120 401	7.4050 404	7.3980 407	7.3910 410	7.3840 413	7.3770 416	7.3700 419	7.3630 422	7.3560 425	7.3490 428	7.3420 431	7.3350 434	7.3280 437	7.3210 440	7.3140 443	7.3070 446	7.3000 449	7.2930 452	7.2860 455	7.2790 458	7.2720 461	7.2650 464	7.2580 467	7.2510 470	7.2440 473	7.2370 476	7.2300 479	7.2230 482	7.2160 485	7.2090 488	7.2020 491	7.1950 494	7.1880 497	7.1810 500	7.1740 503	7.1670 506	7.1600 509	7.1530 512	7.1460 515	7.1390 518	7.1320 521	7.1250 524	7.1180 527	7.1110 530	7.1040 533	7.0970 536	7.0900 539	7.0830 542	7.0760 545	7.0690 548	7.0620 551	7.0550 554	7.0480 557	7.0410 560	7.0340 563	7.0270 566	7.0200 569	7.0130 572	7.0060 575	7.0000 578	6.9930 581	6.9860 584	6.9790 587	6.9720 590	6.9650 593	6.9580 596	6.9510 599	6.9440 602	6.9370 605	6.9300 608	6.9230 611	6.9160 614	6.9090 617	6.9020 620	6.8950 623	6.8880 626	6.8810 629	6.8740 632	6.8670 635	6.8600 638	6.8530 641	6.8460 644	6.8390 647	6.8320 650	6.8250 653	6.8180 656	6.8110 659	6.8040 662	6.7970 665	6.7900 668	6.7830 671	6.7760 674	6.7690 677	6.7620 680	6.7550 683	6.7480 686	6.7410 689	6.7340 692	6.7270 695	6.7200 698	6.7130 701	6.7060 704	6.6990 707	6.6920 710	6.6850 713	6.6780 716	6.6710 719	6.6640 722	6.6570 725	6.6500 728	6.6430 731	6.6360 734	6.6290 737	6.6220 740	6.6150 743	6.6080 746	6.6010 749	6.5940 752	6.5870 755	6.5800 758	6.5730 761	6.5660 764	6.5590 767	6.5520 770	6.5450 773	6.5380 776	6.5310 779	6.5240 782	6.5170 785	6.5100 788	6.5030 791	6.4960 794	6.4890 797	6.4820 800	6.4750 803	6.4680 806	6.4610 809	6.4540 812	6.4470 815	6.4400 818	6.4330 821	6.4260 824	6.4190 827	6.4120 830	6.4050 833	6.3980 836	6.3910 839	6.3840 842	6.3770 845	6.3700 848	6.3630 851	6.3560 854	6.3490 857	6.3420 860	6.3350 863	6.3280 866	6.3210 869	6.3140 872	6.3070 875	6.3000 878	6.2930 881	6.2860 884	6.2790 887	6.2720 890	6.2650 893	6.2580 896	6.2510 899	6.2440 902	6.2370 905	6.2300 908	6.2230 911	6.2160 914	6.2090 917	6.2020 920	6.1950 923	6.1880 926	6.1810 929	6.1740 932	6.1670 935	6.1600 938	6.1530 941	6.1460 944	6.1390 947	6.1320 950	6.1250 953	6.1180 956	6.1110 959	6.1040 962	6.0970 965	6.0900 968	6.0830 971	6.0760 974	6.0690 977	6.0620 980	6.0550 983	6.0480 986	6.0410 989	6.0340 992	6.0270 995	6.0200 998	6.0130 1001	6.0060 1004	6.0000 1007	5.9930 1010	5.9860 1013	5.9790 1016	5.9720 1019	5.9650 1022	5.9580 1025	5.9510 1028	5.9440 1031	5.9370 1034	5.9300 1037	5.9230 1040	5.9160 1043	5.9090 1046	5.9020 1049	5.8950 1052	5.8880 1055	5.8810 1058	5.8740 1061	5.8670 1064	5.8600 1067	5.8530 1070	5.8460 1073	5.8390 1076	5.8320 1079	5.8250 1082	5.8180 1085	5.8110 1088	5.8040 1091	5.7970 1094	5.7900 1097	5.7830 1100	5.7760 1103	5.7690 1106	5.7620 1109	5.7550 1112	5.7480 1115	5.7410 1118	5.7340 1121	5.7270 1124	5.7200 1127	5.7130 1130	5.7060 1133	5.6990 1136	5.6920 1139	5.6850 1142	5.6780 1145	5.6710 1148	5.6640 1151	5.6570 1154	5.6500 1157	5.6430 1160	5.6360 1163	5.6290 1166	5.6220 1169	5.6150 1172	5.6080 1175	5.6010 1178	5.5940 1181	5.5870 1184	5.5800 1187	5.5730 1190	5.5660 1193	5.5590 1196	5.5520 1199	5.5450 1202	5.5380 1205	5.5310 1208	5.5240 1211	5.5170 1214	5.5100 1217	5.5030 1220	5.4960 1223	5.4890 1226	5.4820 1229	5.4750 1232	5.4680 1235	5.4610 1238	5.4540 1241	5.4470 1244	5.4400 1247	5.4330 1250	5.4260 1253	5.4190 1256	5.4120 1259	5.4050 1262	5.3980 1265	5.3910 1268	5.3840 1271	5.3770 1274	5.3700 1277	5.3630 1280	5.3560 1283	5.3490 1286	5.3420 1289	5.3350 1292	5.3280 1295	5.3210 1298	5.3140 1301	5.3070 1304	5.3000 1307	5.2930 1310	5.2860 1313	5.2790 1316	5.2720 1319	5.2650 1322	5.2580 1325	5.2510 1328	5.2440 1331	5.2370 1334	5.2300 1337	5.2230 1340	5.2160 1343	5.2090 1346	5.2020 1349	5.1950 1352	5.1880 1355	5.1810 1358	5.1740 1361	5.1670 1364	5.1600 1367	5.1530 1370	5.1460 1373	5.1390 1376	5.1320 1379	5.1250 1382	5.1180 1385	5.1110 1388	5.1040 1391	5.0970 1394	5.0900 1397	5.0830 1400	5.0760 1403	5.0690 1406	5.0620 1409	5.0550 1412	5.0480 1415	5.0410 1418	5.0340 1421	5.0270 1424	5.0200 1427	5.0130 1430	5.0060 1433	5.0000 1436	4.9930 1439	4.9860 1442	4.9790 1445	4.9720 1448	4.9650 1451	4.9580 1454	4.9510 1457	4.9440 1460	4.9370 1463	4.9300 1466	4.9230 1469	4.9160 1472	4.9090 1475	4.9020 1478	4.8950 1481	4.8880 1484	4.8810 1487	4.8740 1490	4.8670 1493	4.8600 1496	4.8530 1499	4.8460 1502	4.8390 1505	4.8320 1508	4.8250 1511	4.8180 1514	4.8110 1517	4.8040 1520	4.7970 1523	4.7900 1526	4.7830 1529	4.7760 1532	4.7690 1535	4.7620 1538	4.7550 1541	4.7480 1544	4.7410 1547	4.7340 1550	4.7270 1553	4.7200 1556	4.7130 1559	4.7060 1562	4.6990 1565	4.6920 1568	4.6850 1571	4.6780 1574	4.6710 1577	4.6640 1580	4.6570 1583	4.6500 1586	4.6430 1589	4.6360 1592	4.6290 1595	4.6220 1598	4.6150 1601	4.6080 1604	4.6010 1607	4.5940 1610	4.5870 1613	4.5800 1616	4.5730 1619	4.5660 1622	4.5590 1625	4.5520 1628	4.5450 1631	4.5380 1634	4.5310 1637	4.5240 1640	4.5170 1643	4.5100 1646	4.5030 1649	4.4960 1652	4.4890 1655	4.4820 1658	4.4750 1661	4.4680 1664	4.4610 1667	4.4540 1670	4.4470 1673	4.4400 1676	4.4330 1679	4.4260 1682	4.4190 1685	4.4120 1688	4.4050 1691	4.3980 1694	4.3910 1697	4.3840 1700	4.3770 1703	4.3700 1706	4.3630 1709	4.3560 1712	4.3490 1715	4.3420 1718	4.3350 1721	4.3280 1724	4.3210 1727	4.3140 1730	4.3070 1733	4.3000 1736	4.2930 1739	4.2860 1742	4.2790 1745	4.2720 1748	4.2650 1751	4.2580 1754	4.2510 1757	4.2440 1760	4.2370 1763	4.2300 1766	4.2230 1769	4.2160 1772	4.2090 1775	4.2020 1778	4.1950 1781	4.1880 1784	4.1810 1787	4.1740 1790	4.1670 1793	4.1600 1796	4.1530 1799	4.1460 1802	4.1390 1805	4.1320 1808	4.1250 1811	4.1180 1814	4.1110 1817	4.1040 1820	4.0970 1823	4.0900 1826	4.0830 1829	4.0760 1832	4.0690 1835	4.0620 1838	4.0550 1841	4.0480 1844	4.0410 1847	4.0340 1850	4.0270 1853	4.0200 1856	4.0130 1859	4.0060 1862	4.0000 1865	3.9930 1868	3.9860 1871	3.9790 1874	3.9720 1877	3.9650 1880	3.9580 1883	3.9510 1886	3.9440 1889	3.9370 1892	3.9300 1895	3.9230 1898	3.9160 1901	3.9090 1904	3.9020 1907	3.8950 1910	3.8880 1913	3.8810 1916	3.8740 1919	3.8670 1922	3.8600 1925	3.8530 1928	3.8460 1931	3.8390 1934	3.8320 1937	3.8250 1940	3.8180 1943	3.8110 1946	3.8040 1949	3.7970 1952	3.7900 1955	3.7830 1958	3.7760 1961	3.7690 1964	3.7620 1967	3.7550 1970	3.7480 1973	3.7410 1976	3.7340 1979	3.7270 1982	3.7200 1985	3.7130 1988	3.7060 1991	3.6990 1994	3.6920 1997	3.6850 2000	3.6780 2003	3.6710 2006	3.6640 2009	3.6570 2012	3.6500 2015	3.6430 2018	3.6360 2021	3.6290 2024	3.6220 2027	3.6150 2030	3.6080 2033	3.6010 2036	3.5940 2039	3.5870 2042	3.5800 2045	3.5730 2048	3.5660 2051	3.5590 2054	3.5520 2057	3.5450 2060	3.5380 2063	3.5310 2066	3.5240 2069	3.5170 2072	3.5100 2075	3.5030 2078	3.4960 2081	3.4890 2084	3.4820 2087	3.4750 2090	3.4680 2093	3.4610 2096	3.4540 2099	3.4470 2102	3.4400 2105	3.4330 2108	3.4260 2111	3.4190 2114	3.4120 2117	3.4050 2120	3.3980 2123	3.3910 2126	3.3840 2129	3.3770 2132	3.3700 2135	3.3630 2138	3.3560 2141	3.3490 2144	3.3420 2147	3.3350 2150	3.3280 2153

LAMBDA (NM)	8500		8500		8500		8500		8500		9000		9000		9000			
	2.50,-2.00	3.00,-2.00	3.50,-2.00	4.00,-2.00	4.50,-2.00	2.00,-2.00	2.50,-2.00	3.00,-2.00	3.50,-2.00									
835.0	7.5706	210	7.5740	192	7.5767	169	7.5775	143	7.5761	116	7.6210	201	7.6232	203	7.6256	198	7.6287	185
845.0	7.5619	195	7.5608	186	7.5618	167	7.5626	141	7.5616	114	7.6214	168	7.6150	186	7.6121	191	7.6135	181
855.0	7.5590	169	7.5503	175	7.5450	168	7.5423	151	7.5410	125	7.6257	126	7.6141	155	7.6019	178	7.5960	163
865.0	7.5566	141	7.5444	155	7.5349	157	7.5284	148	7.5250	127	7.6244	094	7.6116	126	7.5965	156	7.5860	170
875.0	7.5626	096	7.5506	111	7.5387	118	7.5276	119	7.5185	110	7.6236	060	7.6152	084	7.6032	109	7.5920	126
885.0	7.5471	095	7.5345	111	7.5211	122	7.5080	128	7.4971	124	7.6070	060	7.5989	084	7.5872	108	7.5745	128
895.0	7.5677	015	7.5590	025	7.5465	036	7.5317	046	7.5173	051	7.6158	004	7.6159	010	7.6115	021	7.6027	034
905.0	7.5205	084	7.5101	097	7.4983	106	7.4860	111	7.4749	110	7.5767	055	7.5703	075	7.5614	094	7.5511	110
915.0	7.5402	006	7.5342	010	7.5247	017	7.5124	023	7.4991	027	7.5849	001	7.5866	003	7.5847	008	7.5793	015
925.0	7.4870	088	7.4759	104	7.4635	116	7.4509	123	7.4394	124	7.5436	058	7.5363	079	7.5262	101	7.5145	121
935.0	7.5113	001	7.5071	003	7.4999	005	7.4900	008	7.4780	011	7.5536	000	7.5561	000	7.5558	002	7.5527	005
945.0	7.4954	002	7.4910	005	7.4837	008	7.4737	012	7.4618	016	7.5379	000	7.5400	001	7.5394	004	7.5361	007
955.0	7.4420	087	7.4311	103	7.4189	117	7.4066	126	7.3953	128	7.4973	056	7.4900	077	7.4800	100	7.4682	121
965.0	7.4654	007	7.4617	004	7.4552	007	7.4462	010	7.4352	013	7.5070	000	7.5091	001	7.5090	003	7.5062	006
975.0	7.4514	000	7.4489	000	7.4439	000	7.4362	001	7.4262	003	7.4919	000	7.4944	000	7.4951	000	7.4939	000
985.0	7.4367	000	7.4344	000	7.4296	000	7.4223	001	7.4126	003	7.4768	000	7.4793	000	7.4801	000	7.4790	000
995.0	7.4213	002	7.4183	004	7.4127	007	7.4047	010	7.3947	013	7.4618	000	7.4638	001	7.4639	003	7.4616	006
1005.0	7.3699	083	7.3603	099	7.3496	113	7.3386	123	7.3281	127	7.4225	055	7.4158	075	7.4066	096	7.3960	116
1015.0	7.3923	002	7.3897	004	7.3846	007	7.3772	011	7.3678	014	7.4322	000	7.4342	001	7.4343	003	7.4323	007
1025.0	7.3790	000	7.3776	000	7.3740	000	7.3681	001	7.3601	002	7.4178	000	7.4201	000	7.4213	000	7.4208	000
1035.0	7.3649	000	7.3636	000	7.3603	000	7.3550	000	7.3477	000	7.4033	000	7.4057	000	7.4069	000	7.4065	000
1045.0	7.3509	000	7.3498	000	7.3467	000	7.3417	000	7.3348	000	7.3890	000	7.3913	000	7.3926	000	7.3924	000
1055.0	7.3370	000	7.3361	000	7.3333	000	7.3286	000	7.3219	000	7.3748	000	7.3771	000	7.3784	000	7.3783	000
1065.0	7.3226	007	7.3218	002	7.3191	002	7.3146	002	7.3083	002	7.3605	000	7.3627	001	7.3640	001	7.3639	001
1075.0	7.3095	000	7.3089	000	7.3064	001	7.3018	002	7.2953	003	7.3467	000	7.3489	000	7.3504	000	7.3505	000
1085.0	7.2945	003	7.2929	006	7.2893	010	7.2835	014	7.2761	018	7.3324	001	7.3342	002	7.3344	005	7.3330	009
1095.0	7.2468	079	7.2394	094	7.2311	108	7.2225	118	7.2139	124	7.2955	053	7.2894	071	7.2817	091	7.2730	110
1105.0	7.2687	001	7.2679	003	7.2653	005	7.2608	008	7.2545	011	7.3054	000	7.3074	001	7.3083	002	7.3079	005
1115.0	7.2560	000	7.2562	000	7.2548	000	7.2515	000	7.2463	001	7.2919	000	7.2942	000	7.2959	000	7.2966	000
1125.0	7.2428	000	7.2432	000	7.2420	000	7.2391	000	7.2346	000	7.2785	000	7.2807	000	7.2825	000	7.2833	000
1135.0	7.2297	000	7.2302	000	7.2292	000	7.2266	000	7.2223	000	7.2650	000	7.2673	000	7.2691	000	7.2700	000
1145.0	7.2168	000	7.2175	000	7.2168	000	7.2144	000	7.2104	000	7.2519	000	7.2541	000	7.2560	000	7.2571	000
1155.0	7.2040	000	7.2049	000	7.2043	000	7.2022	000	7.1985	000	7.2388	000	7.2410	000	7.2430	000	7.2441	000
1165.0	7.1911	000	7.1920	001	7.1916	001	7.1898	001	7.1863	001	7.2257	000	7.2279	000	7.2299	000	7.2311	000
1175.0	7.1782	001	7.1793	001	7.1791	001	7.1774	001	7.1743	001	7.2127	000	7.2149	000	7.2169	001	7.2182	001
1185.0	7.1659	000	7.1671	000	7.1671	001	7.1657	001	7.1627	001	7.2000	000	7.2022	000	7.2042	000	7.2057	000
1195.0	7.1535	000	7.1549	000	7.1551	000	7.1539	000	7.1512	000	7.1872	000	7.1895	000	7.1916	000	7.1932	000
1205.0	7.1411	000	7.1427	000	7.1431	000	7.1421	000	7.1396	000	7.1746	000	7.1769	000	7.1790	000	7.1807	000
1215.0	7.1288	000	7.1305	000	7.1311	000	7.1303	000	7.1281	000	7.1620	000	7.1643	000	7.1665	000	7.1683	000
1225.0	7.1166	000	7.1184	000	7.1192	000	7.1186	000	7.1167	000	7.1496	000	7.1519	000	7.1541	000	7.1560	000
1235.0	7.1045	000	7.1064	000	7.1073	000	7.1070	000	7.1052	000	7.1372	000	7.1395	000	7.1418	000	7.1437	000
1245.0	7.0924	000	7.0945	000	7.0956	000	7.0954	000	7.0939	000	7.1250	000	7.1272	000	7.1296	000	7.1316	000
1255.0	7.0805	000	7.0826	000	7.0839	000	7.0839	000	7.0825	000	7.1128	000	7.1150	000	7.1174	000	7.1195	000
1265.0	7.0685	000	7.0707	000	7.0717	001	7.0713	003	7.0695	005	7.1007	000	7.1029	000	7.1053	000	7.1071	001
1275.0	7.0526	010	7.0526	015	7.0512	022	7.0486	029	7.0447	035	7.0873	003	7.0878	007	7.0876	013	7.0865	021
1285.0	7.0137	070	7.0101	083	7.0061	095	7.0015	105	6.9966	114	7.0552	048	7.0508	063	7.0462	078	7.0412	093
1295.0	7.0331	001	7.0351	002	7.0361	004	7.0359	006	7.0343	009	7.0648	000	7.0669	000	7.0690	001	7.0705	003
1305.0	7.0218	000	7.0246	000	7.0265	000	7.0273	000	7.0266	002	7.0531	000	7.0553	000	7.0579	000	7.0603	000
1315.0	7.0103	000	7.0131	000	7.0152	000	7.0164	000	7.0164	000	7.0414	000	7.0436	000	7.0462	000	7.0487	000
1325.0	6.9989	000	7.0018	000	7.0041	000	7.0054	000	7.0056	000	7.0298	000	7.0320	000	7.0346	000	7.0372	000
1335.0	6.9875	000	6.9905	000	6.9929	000	6.9944	000	6.9948	000	7.0182	000	7.0205	000	7.0231	000	7.0257	000
1345.0	6.9763	000	6.9793	000	6.9818	000	6.9835	000	6.9841	000	7.0068	000	7.0090	000	7.0117	000	7.0144	000
1355.0	6.9651	000	6.9682	000	6.9708	000	6.9726	000	6.9734	000	6.9954	000	6.9976	000	7.0003	000	7.0031	000
1365.0	6.9539	000	6.9572	000	6.9599	000	6.9618	000	6.9628	000	6.9841	000	6.9863	000	6.9890	000	6.9918	000
1375.0	6.9428	000	6.9461	000	6.9490	000	6.9510	000	6.9521	000	6.9729	000	6.9751	000	6.9778	000	6.9806	000
1385.0	6.9318	000	6.9352	000	6.9382	000	6.9404	000	6.9417	000	6.9617	000	6.9639	000	6.9667	000	6.9695	000
1395.0	6.9209	000	6.9244	000	6.9274	000	6.9298	000	6.9312	000	6.9506	000	6.9528	000	6.9556	000	6.9585	000
1405.0	6.9100	000	6.9136	000	6.9167	000	6.9192	000	6.9208	000	6.9396	000	6.9418	000	6.9446	000	6.9476	000
1415.0	6.8992	000	6.9028	000	6.9061	000	6.9087	000	6.9105	000	6.9286	000	6.9308	000	6.9336	000	6.9366	000
1425.0	6.8885	000	6.8922	000	6.8956	000	6.8984	000	6.9004	000	6.9178	000	6.9200	000	6.9228	000	6.9259	000
1435.0	6.8778	000	6.8816	000	6.8851	000	6.8880	000	6.8901	000	6.9070	000	6.9092	000	6.9120	000	6.9151	000
1445.0	6.8672	000	6.8710	000	6.8746	000	6.8776	000	6.8799	000	6.8962	000	6.8984	000	6.9012	000	6.9044	000
1454.4	6.8573	000	6.8612	000	6.8648	000	6.8680	000	6.8704	000	6.8862	000	6.8883	000	6.8912	000	6.8944	000
1464.4	6.8492	062	6.8527	060	6.8562	056	6.8592	051	6.8614	044	6.8789	055	6.8811	057	6.8833	058	6.8859	057
1475.0	6.8383	061	6.8418	060	6.8453	056												

LAMBDA (NM)	9000 4.00,-2.00	9000 4.50,-2.00	9500 2.00,-2.00	9500 2.50,-2.00	9500 3.00,-2.00	9500 3.50,-2.00	9500 4.00,-2.00	9500 4.50,-2.00	10000 2.00,-2.00
22.9	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
23.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
24.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
25.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
25.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
26.0	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
26.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
27.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
28.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
29.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
30.1	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
30.9	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
32.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
34.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
35.1	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
35.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
36.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
37.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
38.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
40.0	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
41.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
42.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
44.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
47.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
49.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
50.6	-5.0346 000	-4.9978 000	-4.2081 000	-4.1647 002	-4.1163 001	-4.0567 001	-4.0361 001	-4.0657 001	-3.1539 009
51.6	-4.6989 000	-4.6629 000	-3.8900 001	-3.8476 001	-3.8009 998	-3.7431 000	-3.7231 000	-3.7522 000	-2.8565 004
54.0	-3.9465 000	-3.9124 000	-3.1778 000	-3.1373 000	-3.0938 000	-3.0398 000	-3.0208 000	-3.0488 000	-2.1947 000
56.4	-3.7617 000	-3.7292 000	-2.5295 000	-2.4905 000	-2.4496 000	-2.3987 000	-2.3804 000	-2.4072 000	-1.5935 000
58.7	-2.6611 000	-2.6299 000	-1.9607 000	-1.9230 000	-1.8841 000	-1.8357 000	-1.8181 000	-1.8437 000	-1.0663 000
61.2	-2.0627 000	-2.0330 000	-1.3937 000	-1.3573 000	-1.3203 000	-1.2743 000	-1.2573 000	-1.2818 000	-.5409 000
64.0	-1.4519 000	-1.4235 000	-.8147 000	-.7796 000	-.7444 000	-.7007 000	-.6843 000	-.7076 000	-.0045 000
67.1	-.8395 000	-.8124 000	-.2339 000	-.2002 000	-.1668 000	-.1253 000	-.1094 000	-.1316 000	-.5337 000
70.5	-.2346 000	-.2089 000	.3398 000	.3722 000	.4039 000	.4434 000	.4586 000	.4376 000	1.0656 000
73.6	.2642 000	.2888 000	.8129 000	.8442 000	.8745 000	.9122 000	.9269 000	.9070 000	1.5043 000
77.0	.7608 000	.7844 000	1.2841 000	1.3142 000	1.3432 000	1.3792 000	1.3934 000	1.3744 000	1.9416 000
81.0	1.2867 000	1.3091 000	1.7830 000	1.8119 000	1.8394 000	1.8737 000	1.8873 000	1.8692 000	2.4047 000
85.0	1.7582 000	1.7794 000	2.2302 000	2.2579 000	2.2841 000	2.3167 000	2.3298 000	2.3127 000	2.8200 000
89.0	2.1827 000	2.2030 000	2.6328 000	2.6593 000	2.6844 000	2.7156 000	2.7282 000	2.7119 000	3.1940 000
92.0	2.95631000	2.92681000	3.70441000	3.63261000	3.58971000	3.56391000	3.53521000	3.49251000	4.18721000
94.0	3.44891000	3.43341000	4.25331000	4.10961000	4.03691000	3.99061000	3.95441000	3.92041000	5.05051000
96.2	3.7457 999	3.7278 999	6.1478 993	4.80021000	4.41101000	4.31631000	4.25691000	4.21171000	7.1399 960
98.7	4.1343 999	4.1016 998	7.6996 749	7.3959 887	6.8017 971	5.8428 996	4.89701000	4.68161000	8.1173 632
101.2	4.2619 998	4.2336 997	7.6199 797	7.2630 918	6.6080 981	5.6280 998	4.9193 999	4.77391000	8.0612 685
103.7	4.3959 997	4.3678 996	7.6144 804	7.2715 917	6.6743 978	5.7962 997	5.0654 999	4.8984 999	8.0562 697
106.2	5.3685 972	4.8726 988	8.1638 322	8.1105 431	7.9458 589	7.6413 762	7.1751 899	6.5286 971	8.4526 260
108.7	6.2157 807	5.7359 913	8.2134 256	8.2134 282	8.1444 347	7.9898 463	7.7440 618	7.3822 788	8.4785 229
111.2	7.8577 724	7.6029 857	8.3506 254	8.4170 270	8.4465 314	8.4286 399	8.3575 525	8.2035 687	8.5408 226
113.7	7.7805 764	7.5030 884	8.3527 258	8.4077 284	8.4261 337	8.3962 431	8.3088 565	8.1342 726	8.5478 222
116.2	7.3788 904	6.9377 968	8.3670 240	8.3939 303	8.3690 411	8.2717 564	8.0796 737	7.7565 882	8.5688 191
118.7	6.0626 995	5.7030 998	8.2271 452	8.1351 614	7.9337 780	7.6032 905	7.1105 971	6.5080 999	8.4854 336
121.0	5.2086 999	5.1862 999	7.0391 965	6.3301 994	5.8042 998	5.6770 999	5.6151 999	5.5670 999	7.6356 907
122.9	5.4995 999	5.4527 999	7.8425 776	7.4713 915	6.8835 980	6.2537 996	5.9657 998	5.8592 998	8.2383 627
125.4	6.8919 975	6.4445 992	8.3519 300	8.3158 429	8.2038 600	7.9966 771	7.6797 898	7.2434 965	8.5659 220
128.5	7.8890 746	7.6324 871	8.4581 112	8.4829 158	8.4784 238	8.4339 362	8.3354 528	8.1579 710	8.6370 084
131.2	8.1663 511	8.0448 661	8.4604 110	8.4955 127	8.5140 162	8.5103 226	8.4806 327	8.4090 471	8.6336 091
133.7	8.2878 344	8.2267 476	8.4857 057	8.5206 067	8.5435 090	8.5523 132	8.5460 203	8.5151 311	8.6534 047
136.2	8.3209 281	8.2932 379	8.4682 093	8.5030 096	8.5289 107	8.5446 132	8.5514 176	8.5428 249	8.6359 082
138.7	8.3552 209	8.3458 286	8.4760 073	8.5083 074	8.5339 081	8.5525 099	8.5657 130	8.5691 155	8.6413 066
141.0	8.3732 167	8.3764 221	8.4766 067	8.5075 065	8.5335 068	8.5543 078	8.5720 100	8.5834 140	8.6416 061
143.3	8.3769 141	8.3860 190	8.4795 056	8.5066 056	8.5305 059	8.5507 068	8.5695 087	8.5843 121	8.6443 049
145.7	8.3852 114	8.4003 154	8.4792 050	8.5044 048	8.5276 050	8.5485 056	8.5693 071	8.5879 087	8.6428 045
148.2	8.3824 107	8.4013 135	8.4774 047	8.4993 045	8.5208 047	8.5412 052	8.5627 064	8.5835 086	8.6407 041
150.7	8.4056 035	8.4393 038	8.4786 035	8.4992 030	8.5212 027	8.5443 025	8.5712 025	8.6013 026	8.6402 033
153.2	8.3998 042	8.4379 040	8.4669 052	8.4862 045	8.5078 040	8.5316 036	8.5598 033	8.5921 031	8.6286 049
155.7	8.3638 101	8.3989 105	8.4497 078	8.4648 076	8.4834 074	8.5046 074	8.5305 076	8.5607 079	8.6130 072
158.2	8.3685 073	8.4043 076	8.4546 057	8.4673 054	8.4846 053	8.5053 053	8.5310 054	8.5613 057	8.6174 052
160.8	8.3707 049	8.4072 051	8.4563 042	8.4668 038	8.4832 036	8.5036 035	8.5295 036	8.5603 037	8.6178 039
163.5	8.3507 072	8.3878 073	8.4375 070	8.4459 066	8.4612 064	8.4814 062	8.5075 062	8.5387 062	8.5994 066
166.3	8.3237 109	8.3596 112	8.4209 091	8.4275 087	8.4417 085	8.4610 084	8.4862 085	8.5166 087	8.5847 084
168.8	8.3339 073	8.3714 074	8.4276 065	8.4317 062	8.4448 061	8.4640 059	8.4896 059	8.5209 059	8.5899 061
171.2	8.3228 079	8.3614 078	8.4135 083	8.4179 076	8.4315 072	8.4513 068	8.4777 066	8.5097 065	8.5757 079
173.7	8.3270 053	8.3656 052	8.4198 057	8.4217 052	8.4341 048	8.4534 045	8.4795 043	8.5115 041	8.5815 054
176.2	8.3189 053	8.3561 056	8.4214 040	8.4205 038	8.4308 037	8.4481 038	8.4725 039	8.5030 041	8.5834 037
178.7	8.3215 030	8.3600 030	8.4176 035	8.4162 031	8.4266 029	8.4447 027	8.4699 025	8.5014 025	8.5784 034
181.5	8.3024 054	8.3408 054	8.4000 059	8.3989 052	8.4097 046	8.4282 043	8.4536 041	8.4851 040	8.5617 056
184.0	8.2940 056	8.3320 056	8.3972 052	8.3937 047	8.4030 044	8.4205 042	8.4452 041	8.4761 042	8.5591 047
186.2	8.2961 037	8.3345 037	8.3947 046	8.3913 039	8.4009 034	8.4189 030	8.4441 028	8.4755 027	8.5545 048
189.2	8.2906 031	8.3293 030	8.3930 034	8.3873 029	8.3956 025	8.4128 023	8.4375 022	8.4688 021	8.5533 033
192.0	8.2871 021	8.3262 019	8.3874 032	8.3811 025	8.3893 021	8.4067 018	8.4316 016	8.4631 014	8.5468 032
194.0	8.2803 024	8.3183 025	8.3861 024	8.3776 021	8.3842 020	8.4003 019	8.4242 019	8.4548 019	8.5457 024
196.4	8.2788 013	8.3166 014	8.3852 013	8.3761 010	8.3826 008	8.3985 007	8.4223 007	8.4527 007	

LAMBDA (NM)	9000 4.00,-2.00		9000 4.50,-2.00		9500 2.00,-2.00		9500 2.50,-2.00		9500 3.00,-2.00		9500 3.50,-2.00		9500 4.00,-2.00		9500 4.50,-2.00		10000 2.00,-2.00		
208.8	8.2413	030	8.2791	030	8.3499	031	8.3385	026	8.3438	023	8.3594	022	8.3826	021	8.4125	020	8.5078	030	
211.2	8.2342	034	8.2714	035	8.3456	029	8.3333	025	8.3379	024	8.3529	023	8.3756	023	8.4049	023	8.5036	027	
213.7	8.2229	047	8.2610	046	8.3318	048	8.3205	041	8.3259	037	8.3417	035	8.3649	033	8.3948	032	8.4902	044	
216.2	8.2182	046	8.2554	046	8.3277	045	8.3154	040	8.3203	037	8.3356	035	8.3584	034	8.3877	034	8.4850	043	
218.7	8.2179	036	8.2552	035	8.3258	039	8.3133	033	8.3180	030	8.3333	028	8.3559	026	8.3852	026	8.4819	038	
221.2	8.2026	058	8.2397	058	8.3112	060	8.2989	054	8.3037	050	8.3189	047	8.3414	046	8.3703	045	8.4669	059	
223.7	8.2052	047	8.2430	040	8.3106	050	8.2987	043	8.3037	038	8.3194	034	8.3422	032	8.3715	030	8.4659	049	
226.2	8.1850	076	8.2218	075	8.2942	075	8.2870	068	8.2868	064	8.3020	061	8.3243	059	8.3529	058	8.4496	073	
228.7	8.1923	050	8.2284	050	8.3014	050	8.2882	045	8.2922	041	8.3068	039	8.3286	038	8.3566	038	8.4553	049	
231.2	8.1893	047	8.2253	047	8.2981	047	8.2854	040	8.2896	036	8.3042	034	8.3258	033	8.3535	033	8.4513	046	
233.7	8.1734	077	8.2088	073	8.2818	072	8.2691	066	8.2733	062	8.2878	060	8.3091	059	8.3364	059	8.4350	070	
236.2	8.1664	078	8.2021	078	8.2729	082	8.2606	074	8.2650	070	8.2797	067	8.3012	065	8.3287	064	8.4248	081	
238.7	8.1531	097	8.1885	097	8.2602	100	8.2490	090	8.2539	088	8.2688	080	8.2903	078	8.3175	077	8.4125	096	
241.2	8.1583	078	8.1934	078	8.2639	083	8.2523	074	8.2569	068	8.2716	065	8.2927	063	8.3196	062	8.4145	082	
243.7	8.1576	071	8.1926	071	8.2634	075	8.2513	067	8.2554	062	8.2697	059	8.2906	057	8.3173	056	8.4128	075	
246.2	8.1495	081	8.1837	081	8.2571	080	8.2447	072	8.2486	068	8.2626	065	8.2830	064	8.3090	064	8.4059	079	
248.7	8.1444	084	8.1775	086	8.2554	075	8.2420	070	8.2450	067	8.2580	066	8.2775	066	8.3025	068	8.4040	073	
250.6	8.1511	063	8.1844	065	8.2603	058	8.2468	053	8.2496	050	8.2624	049	8.2821	049	8.3072	050	8.4079	057	
251.9	8.1428	077	8.1743	082	8.2603	054	8.2453	052	8.2469	052	8.2584	054	8.2764	057	8.2997	061	8.4066	050	
253.7	8.1238	112	8.1565	113	8.2344	103	8.2221	096	8.2255	092	8.2386	090	8.2579	090	8.2824	091	8.3818	100	
256.2	8.1463	057	8.1795	057	8.2526	056	8.2393	051	8.2422	048	8.2552	046	8.2747	045	8.2996	044	8.3985	055	
258.7	8.1433	056	8.1756	057	8.2504	053	8.2366	049	8.2391	046	8.2516	045	8.2705	045	8.2947	046	8.3960	051	
261.2	8.1397	058	8.1715	058	8.2452	056	8.2319	051	8.2347	048	8.2473	047	8.2662	046	8.2905	045	8.3898	054	
263.7	8.1446	039	8.1766	039	8.2497	039	8.2358	035	8.2382	033	8.2505	031	8.2691	031	8.2930	030	8.3930	038	
266.2	8.1475	025	8.1794	025	8.2523	025	8.2381	022	8.2402	020	8.2522	019	8.2705	019	8.2941	018	8.3949	023	
268.7	8.1440	026	8.1755	026	8.2488	025	8.2346	022	8.2366	021	8.2484	020	8.2665	019	8.2897	019	8.3907	023	
271.2	8.1356	038	8.1666	038	8.2412	034	8.2276	031	8.2296	029	8.2414	028	8.2591	028	8.2818	028	8.3823	032	
273.7	8.1249	055	8.1549	057	8.2308	050	8.2171	046	8.2190	045	8.2304	044	8.2476	045	8.2697	046	8.3709	048	
276.2	8.1264	045	8.1567	045	8.2308	042	8.2175	038	8.2195	036	8.2310	035	8.2484	035	8.2706	035	8.3701	040	
278.7	8.1224	047	8.1514	050	8.2287	040	8.2151	037	8.2169	035	8.2281	034	8.2449	035	8.2662	036	8.3679	036	
281.2	8.1301	024	8.1591	026	8.2348	019	8.2208	017	8.2223	016	8.2332	015	8.2498	016	8.2710	016	8.3726	016	
283.7	8.1248	029	8.1543	029	8.2271	029	8.2140	025	8.2158	023	8.2268	022	8.2436	022	8.2650	022	8.3633	028	
286.2	8.1184	037	8.1473	038	8.2218	033	8.2086	030	8.2102	028	8.2210	028	8.2376	027	8.2586	027	8.3581	031	
288.7	8.1219	023	8.1508	023	8.2244	020	8.2111	018	8.2126	016	8.2232	016	8.2395	015	8.2602	015	8.3595	018	
291.2	8.1262	007	8.1547	007	8.2275	006	8.2137	005	8.2148	005	8.2251	004	8.2410	004	8.2615	004	8.3612	005	
293.7	8.1161	024	8.1441	024	8.2178	021	8.2044	019	8.2057	018	8.2159	018	8.2316	018	8.2517	018	8.3509	020	
296.2	8.1174	015	8.1449	016	8.2189	012	8.2055	010	8.2066	009	8.2166	009	8.2320	009	8.2518	010	8.3508	011	
298.7	8.1158	017	8.1429	013	8.2168	009	8.2034	008	8.2044	008	8.2142	008	8.2294	008	8.2488	008	8.3478	009	
301.2	8.1148	009	8.1411	010	8.2168	002	8.2031	002	8.2037	003	8.2130	003	8.2278	004	8.2466	005	8.3469	002	
303.7	8.1139	004	8.1404	005	8.2139	002	8.2004	002	8.2012	002	8.2106	002	8.2253	002	8.2442	002	8.3431	002	
306.2	8.1102	007	8.1365	007	8.2102	003	8.1968	003	8.1976	003	8.2068	003	8.2214	003	8.2401	004	8.3388	003	
308.7	8.1062	010	8.1319	011	8.2067	005	8.1934	004	8.1941	005	8.2031	005	8.2173	005	8.2355	006	8.3346	003	
311.2	8.1041	009	8.1299	009	8.2029	006	8.1900	006	8.1909	005	8.2000	005	8.2142	005	8.2325	005	8.3299	005	
313.7	8.1028	006	8.1284	005	8.2007	005	8.1879	004	8.1888	003	8.1978	003	8.2119	003	8.2298	003	8.3267	004	
316.2	8.0997	007	8.1249	007	8.1978	005	8.1849	004	8.1856	004	8.1944	004	8.2083	004	8.2260	004	8.3230	004	
318.7	8.0946	017	8.1193	013	8.1931	008	8.1805	008	8.1812	008	8.1899	008	8.2034	008	8.2208	008	8.3176	007	
321.2	8.0948	006	8.1193	006	8.1921	004	8.1795	004	8.1802	003	8.1887	003	8.2022	003	8.2194	003	8.3156	003	
323.7	8.0899	011	8.1142	011	8.1877	007	8.1752	007	8.1758	007	8.1842	007	8.1975	007	8.2144	007	8.3110	005	
326.2	8.0900	005	8.1141	005	8.1864	003	8.1741	003	8.1747	003	8.1830	003	8.1961	003	8.2128	003	8.3084	002	
328.7	8.0881	003	8.1119	003	8.1839	002	8.1717	002	8.1723	002	8.1804	002	8.1933	002	8.2098	002	8.3049	002	
331.2	8.0862	007	8.1096	002	8.1815	001	8.1694	001	8.1699	001	8.1779	001	8.1906	001	8.2068	001	8.3015	001	
333.7	8.0810	008	8.1042	007	8.1771	004	8.1650	004	8.1655	004	8.1734	004	8.1860	004	8.2020	004	8.2969	003	
336.2	8.0791	006	8.1021	006	8.1743	004	8.1624	004	8.1629	004	8.1708	004	8.1831	004	8.1989	004	8.2931	003	
338.7	8.0772	004	8.0997	005	8.1721	002	8.1604	002	8.1608	002	8.1684	002	8.1806	002	8.1961	002	8.2901	001	
341.2	8.0750	004	8.0972	004	8.1693	002	8.1577	002	8.1581	002	8.1656	002	8.1776	002	8.1928	002	8.2863	002	
343.7	8.0730	007	8.0948	003	8.1669	001	8.1552	001	8.1556	001	8.1630	001	8.1748	001	8.1898	001	8.2830	001	
346.2	8.0706	007	8.0922	002	8.1639	001	8.1524	001	8.1528	001	8.1601	001	8.1718	001	8.1866	001	8.2793	001	
348.7	8.0678	007	8.0891	002	8.1610	001	8.1496	001	8.1500	001	8.1571	001	8.1686	001	8.1832	001	8.2756	001	
351.2	8.0654	007	8.0865	002	8.1582	000	8.1468	000	8.1472	000	8.1542	000	8.1656	000	8.1799	000	8.2721	000	
353.7	8.0631	001	8.0839	001	8.1553	000	8.1441	000	8.1444	000	8.1514	000	8.1626	000	8.1768	000	8.2684	000	
356.2	8.0600	002	8.0805	002	8.1523	000	8.1412	000	8.1414	000	8.1483	000	8.1593	001	8.1732	001	8.2647	000	
358.7	8.0574	002	8.0777	002	8.1492	000	8.1382	000	8.1385	000	8.1453	001	8.1561	001	8.1699	001	8.2610	000	
361.2	8.0545	002	8.0744	003	8.1463	000	8.1353	000	8.1356	000	8.1422	001	8.1529	001	8.1664	001	8.2573	000	
363.6	8.0516	003	8.0715	003	8.1429	001	8.1321	002	8.1323	002	8.1388	002	8.1494	002	8.1627	002	8.2533	001	
366.1	8.0594	751	8.0783	732	8.1567	709													

LAMBDA (NM)	9000 4.00,-2.00		9000 4.50,-2.00		9500 2.00,-2.00		9500 2.50,-2.00		9500 3.00,-2.00		9500 3.50,-2.00		9500 4.00,-2.00		9500 4.50,-2.00		10000 2.00,-2.00		
421.2	8.4935	007	8.4797	012	8.5391	000	8.5550	000	8.5636	000	8.5668	002	8.5659	005	8.5606	009	8.5869	000	
423.7	8.4854	010	8.4714	015	8.5322	000	8.5477	001	8.5561	001	8.5588	003	8.5580	006	8.5525	011	8.5800	000	
426.2	8.4768	013	8.4616	021	8.5255	000	8.5407	000	8.5487	001	8.5510	004	8.5497	008	8.5431	016	8.5732	000	
428.7	8.4664	026	8.4452	042	8.5188	000	8.5335	001	8.5401	004	8.5417	009	8.5382	018	8.5278	034	8.5665	000	
431.2	8.4212	103	8.3888	146	8.5103	005	8.5222	011	8.5247	023	8.5188	044	8.5029	079	8.4758	129	8.5586	003	
433.7	8.1707	488	8.1358	515	8.4100	198	8.3829	271	8.3430	346	8.2996	413	8.2562	470	8.2158	513	8.4707	173	
436.2	8.3665	183	8.3293	231	8.4936	012	8.5003	029	8.4943	059	8.4778	101	8.4508	156	8.4148	218	8.5423	010	
438.7	8.4313	036	8.4108	058	8.4914	002	8.5044	004	8.5102	008	8.5108	014	8.5057	026	8.4931	048	8.5389	002	
441.2	8.4349	013	8.4204	022	8.4856	000	8.4989	001	8.5059	001	8.5078	004	8.5063	009	8.4998	017	8.5332	000	
443.7	8.4310	006	8.4185	011	8.4790	000	8.4921	000	8.4993	000	8.5022	001	8.5013	004	8.4967	008	8.5264	001	
446.2	8.4250	004	8.4134	007	8.4715	003	8.4845	002	8.4917	002	8.4950	002	8.4947	003	8.4908	006	8.5186	003	
448.7	8.4180	005	8.4068	007	8.4641	005	8.4768	004	8.4838	004	8.4871	004	8.4877	003	8.4838	006	8.5115	004	
451.2	8.4127	007	8.4015	004	8.4589	002	8.4713	001	8.4781	001	8.4813	001	8.4818	001	8.4783	002	8.5064	001	
453.7	8.4058	002	8.3949	004	8.4526	001	8.4646	001	8.4713	001	8.4744	001	8.4748	001	8.4719	001	8.5001	001	
456.2	8.3995	001	8.3893	001	8.4463	001	8.4580	001	8.4645	001	8.4676	001	8.4681	001	8.4654	001	8.4937	000	
458.7	8.3929	001	8.3829	001	8.4397	001	8.4513	001	8.4577	001	8.4608	001	8.4613	001	8.4586	001	8.4871	001	
461.2	8.3865	000	8.3766	001	8.4336	000	8.4449	000	8.4512	000	8.4541	000	8.4546	000	8.4520	000	8.4809	000	
463.7	8.3799	000	8.3699	001	8.4272	000	8.4382	000	8.4444	000	8.4473	000	8.4478	000	8.4452	000	8.4744	000	
466.2	8.3734	000	8.3629	002	8.4209	000	8.4316	000	8.4377	000	8.4405	000	8.4411	000	8.4383	001	8.4680	000	
468.7	8.3665	001	8.3560	004	8.4145	000	8.4250	000	8.4309	000	8.4337	000	8.4342	000	8.4307	003	8.4616	000	
471.2	8.3582	005	8.3479	007	8.4076	001	8.4179	001	8.4237	001	8.4264	002	8.4266	002	8.4229	005	8.4546	002	
473.7	8.3518	005	8.3413	008	8.4017	000	8.4117	000	8.4174	001	8.4201	001	8.4195	003	8.4160	006	8.4488	000	
476.2	8.3450	006	8.3339	010	8.3955	000	8.4053	000	8.4110	000	8.4132	001	8.4125	004	8.4084	008	8.4426	000	
478.7	8.3356	013	8.3229	021	8.3892	000	8.3987	000	8.4038	001	8.4051	005	8.4037	009	8.3979	017	8.4362	000	
481.2	8.3206	032	8.3031	051	8.3829	000	8.3914	002	8.3952	006	8.3952	012	8.3906	024	8.3795	044	8.4299	000	
483.7	8.2663	133	8.2375	172	8.3734	008	8.3780	018	8.3742	039	8.3627	069	8.3425	113	8.3149	164	8.4211	006	
486.2	8.0540	461	8.0285	481	8.2745	198	8.2431	269	8.2032	342	8.1640	402	8.1292	449	8.0989	484	8.3349	173	
488.7	8.7529	135	8.2245	174	8.3608	006	8.3648	019	8.3605	040	8.3487	071	8.3285	115	8.3011	165	8.4085	006	
491.2	8.2957	031	8.2790	050	8.3574	002	8.3653	003	8.3689	007	8.3690	002	8.3647	024	8.3541	043	8.4042	002	
493.7	8.2984	011	8.2866	019	8.3519	000	8.3603	000	8.3648	001	8.3661	014	8.3650	008	8.3597	016	8.3987	000	
496.2	8.2947	006	8.2848	009	8.3458	000	8.3540	000	8.3588	000	8.3610	001	8.3604	004	8.3569	008	8.3925	000	
498.7	8.2896	003	8.2805	005	8.3397	000	8.3476	000	8.3524	000	8.3550	000	8.3549	002	8.3521	004	8.3864	000	
502.5	8.2813	001	8.2723	003	8.3302	001	8.3379	000	8.3427	000	8.3452	000	8.3460	000	8.3434	002	8.3767	001	
507.5	8.2634	000	8.2527	001	8.3181	000	8.3251	000	8.3291	000	8.3308	000	8.3302	000	8.3266	000	8.3648	000	
512.5	8.2514	000	8.2411	000	8.3060	000	8.3127	000	8.3166	000	8.3183	000	8.3178	000	8.3143	000	8.3527	000	
517.5	8.2389	001	8.2287	002	8.2940	000	8.3003	000	8.3041	000	8.3057	000	8.3052	001	8.3017	001	8.3407	000	
522.5	8.2275	000	8.2176	000	8.2821	000	8.2882	000	8.2918	000	8.2935	000	8.2931	000	8.2898	000	8.3287	000	
527.5	8.2157	000	8.2061	000	8.2703	000	8.2761	000	8.2796	000	8.2812	000	8.2809	000	8.2777	000	8.3168	000	
532.5	8.2040	000	8.1946	000	8.2585	000	8.2640	000	8.2674	000	8.2690	000	8.2688	000	8.2657	000	8.3050	000	
537.5	8.1925	000	8.1834	000	8.2469	000	8.2521	000	8.2554	000	8.2570	000	8.2568	000	8.2539	000	8.2933	000	
542.5	8.1810	000	8.1721	000	8.2353	000	8.2403	000	8.2435	000	8.2451	000	8.2449	000	8.2421	000	8.2810	000	
547.5	8.1697	000	8.1610	000	8.2238	000	8.2285	000	8.2316	000	8.2332	000	8.2331	000	8.2304	000	8.2700	000	
552.5	8.1584	000	8.1500	000	8.2124	000	8.2168	000	8.2198	000	8.2214	000	8.2214	000	8.2188	000	8.2585	000	
557.5	8.1472	000	8.1390	000	8.2010	000	8.2052	000	8.2081	000	8.2098	000	8.2098	000	8.2073	000	8.2471	000	
562.5	8.1361	000	8.1281	000	8.1897	000	8.1937	000	8.1965	000	8.1982	000	8.1982	000	8.1959	000	8.2357	000	
567.5	8.1251	000	8.1173	000	8.1785	000	8.1823	000	8.1850	000	8.1867	000	8.1868	000	8.1846	000	8.2244	000	
572.5	8.1141	000	8.1066	000	8.1673	000	8.1709	000	8.1736	000	8.1752	000	8.1754	000	8.1733	000	8.2132	000	
577.5	8.1033	000	8.0959	000	8.1562	000	8.1597	000	8.1622	000	8.1639	000	8.1641	000	8.1621	000	8.2020	000	
582.5	8.0925	000	8.0854	000	8.1452	000	8.1485	000	8.1510	000	8.1527	000	8.1529	000	8.1511	000	8.1909	000	
587.5	8.0817	000	8.0748	000	8.1343	000	8.1373	000	8.1398	000	8.1415	000	8.1418	000	8.1400	000	8.1799	000	
592.5	8.0711	000	8.0644	000	8.1234	000	8.1263	000	8.1287	000	8.1304	000	8.1308	000	8.1291	000	8.1689	000	
597.5	8.0606	000	8.0541	000	8.1126	000	8.1153	000	8.1176	000	8.1194	000	8.1198	000	8.1183	000	8.1580	000	
602.5	8.0501	000	8.0438	000	8.1019	000	8.1044	000	8.1067	000	8.1084	000	8.1090	000	8.1075	000	8.1473	000	
607.5	8.0397	000	8.0336	000	8.0912	000	8.0936	000	8.0958	000	8.0976	000	8.0982	000	8.0968	000	8.1365	000	
612.5	8.0294	000	8.0234	000	8.0806	000	8.0829	000	8.0850	000	8.0868	000	8.0874	000	8.0862	000	8.1258	000	
617.5	8.0191	000	8.0133	000	8.0701	000	8.0722	000	8.0743	000	8.0761	000	8.0768	000	8.0756	000	8.1152	000	
622.5	8.0089	000	8.0033	000	8.0596	000	8.0616	000	8.0636	000	8.0654	000	8.0662	000	8.0651	000	8.1046	000	
627.5	7.9988	000	7.9934	000	8.0492	000	8.0510	000	8.0531	000	8.0549	000	8.0557	000	8.0548	000	8.0942	000	
632.5	7.9887	000	7.9835	000	8.0389	000	8.0405	000	8.0425	000	8.0444	000	8.0452	000	8.0444	000	8.0837	000	
637.5	7.9787	000	7.9736	000	8.0286	000	8.0302	000	8.0321	000	8.0340	000	8.0349	000	8.0341	000	8.0734	000	
642.5	7.9683	001	7.9626	003	8.0184	000	8.0198	000	8.0217	000	8.0236	000	8.0243	001	8.0227	003	8.0631	000	
647.5	7.9563	006	7.9501	010	8.0082	000	8.0095	000	8.0113	000	8.0125	002	8.0123	005	8.0100	009	8.0528	000	
652.5	7.9283	047	7.9167	062	7.9970	003	7.9965	007	7.9950	014	7.9919	026	7.9859	041	7.9762	061	8.0419	002	
657.5	7.8387	207	7.8241	225	7.9525	079	7.9403	107	7.9265	138	7.9121	170	7.8969	201	7.8809	229	8.0017	069	
662.5	7.9230	015	7.9153	023	7.9781	002													

LAMBDA (NM)	9000	9000	9500	9500	9500	9500	9500	9500	9500	10000								
	4.00,-2.00	4.50,-2.00	2.00,-2.00	2.50,-2.00	3.00,-2.00	3.50,-2.00	4.00,-2.00	4.50,-2.00	4.50,-2.00	2.00,-2.00								
835.0	7.6307	167	7.6310	146	7.6656	182	7.6679	189	7.6707	189	7.6742	183	7.6773	173	7.6785	161	7.7055	165
845.0	7.6154	165	7.6160	143	7.6660	148	7.6599	171	7.6571	182	7.6586	180	7.6616	170	7.6631	158	7.7055	131
855.0	7.5938	174	7.5938	155	7.6683	109	7.6598	138	7.6480	166	7.6409	180	7.6392	180	7.6397	171	7.7053	096
865.0	7.5797	170	7.5769	157	7.6656	079	7.6570	109	7.6425	143	7.6310	167	7.6250	175	7.6224	172	7.7009	070
875.0	7.5813	135	7.5720	135	7.6624	050	7.6578	072	7.6476	099	7.6372	121	7.6278	137	7.6186	147	7.6961	044
885.0	7.5611	144	7.5487	150	7.6457	050	7.6411	072	7.6314	097	7.6201	122	7.6077	144	7.5945	162	7.6793	044
895.0	7.5896	051	7.5749	065	7.6507	002	7.6536	007	7.6524	015	7.6473	029	7.6376	047	7.6237	070	7.6817	002
905.0	7.5394	124	7.5277	131	7.6148	046	7.6112	065	7.6040	085	7.5954	105	7.5854	123	7.5739	139	7.6481	041
915.0	7.5700	025	7.5581	034	7.6191	001	7.6231	002	7.6238	006	7.6219	012	7.6164	022	7.6070	036	7.6497	000
925.0	7.5017	137	7.4890	147	7.5818	048	7.5771	068	7.5687	091	7.5583	114	7.5464	137	7.5332	157	7.6152	042
935.0	7.5468	008	7.5375	013	7.5875	000	7.5918	000	7.5937	001	7.5936	004	7.5914	007	7.5861	012	7.6180	000
945.0	7.5296	013	7.5198	019	7.5717	000	7.5757	001	7.5772	002	7.5768	006	7.5739	011	7.5676	019	7.6022	000
955.0	7.4552	139	7.4424	151	7.5352	047	7.5302	067	7.5218	090	7.5111	114	7.4986	138	7.4849	160	7.5684	041
965.0	7.5005	011	7.4919	016	7.5407	000	7.5445	001	7.5462	002	7.5461	005	7.5438	009	7.5385	016	7.5712	000
975.0	7.4899	001	7.4830	003	7.5255	000	7.5293	000	7.5316	000	7.5327	000	7.5322	001	7.5290	003	7.5559	000
985.0	7.4752	001	7.4685	003	7.5104	000	7.5140	000	7.5163	000	7.5175	000	7.5171	001	7.5140	003	7.5407	000
995.0	7.4567	010	7.4489	016	7.4953	000	7.4986	001	7.5003	002	7.5003	005	7.4984	009	7.4938	016	7.5256	000
1005.0	7.3842	134	7.3724	148	7.4600	046	7.4549	065	7.4469	086	7.4370	110	7.4254	133	7.4128	155	7.4928	040
1015.0	7.4278	011	7.4205	016	7.4656	000	7.4687	001	7.4703	002	7.4704	005	7.4686	010	7.4642	016	7.4959	000
1025.0	7.4181	001	7.4128	002	7.4511	000	7.4543	000	7.4564	000	7.4579	000	7.4581	000	7.4562	002	7.4812	000
1035.0	7.4044	000	7.4000	000	7.4365	000	7.4397	000	7.4418	000	7.4433	000	7.4437	000	7.4426	000	7.4667	000
1045.0	7.3904	000	7.3863	000	7.4221	000	7.4252	000	7.4273	000	7.4288	000	7.4293	000	7.4284	000	7.4522	000
1055.0	7.3766	000	7.3727	000	7.4078	000	7.4108	000	7.4129	000	7.4145	000	7.4151	000	7.4143	000	7.4379	000
1065.0	7.3622	002	7.3586	002	7.3936	000	7.3964	000	7.3984	000	7.4000	001	7.4006	001	7.3998	001	7.4236	000
1075.0	7.3487	001	7.3444	003	7.3796	000	7.3824	000	7.3844	000	7.3861	000	7.3865	001	7.3851	003	7.4096	000
1085.0	7.3294	015	7.3234	021	7.3654	001	7.3677	002	7.3689	002	7.3689	008	7.3673	013	7.3634	021	7.3953	001
1095.0	7.2635	127	7.2538	140	7.3320	045	7.3268	062	7.3196	084	7.3110	103	7.3014	125	7.2908	146	7.3644	039
1105.0	7.3056	008	7.3010	012	7.3381	000	7.3405	000	7.3421	002	7.3430	004	7.3426	007	7.3402	012	7.3679	000
1115.0	7.2957	000	7.2927	002	7.3245	000	7.3270	000	7.3291	000	7.3309	000	7.3320	000	7.3314	002	7.3543	000
1125.0	7.2828	000	7.2805	000	7.3110	000	7.3134	000	7.3155	000	7.3174	000	7.3186	000	7.3187	000	7.3408	000
1135.0	7.2697	000	7.2677	000	7.2976	000	7.2999	000	7.3019	000	7.3039	000	7.3052	000	7.3054	000	7.3273	000
1145.0	7.2569	000	7.2551	000	7.2843	000	7.2866	000	7.2886	000	7.2906	000	7.2920	000	7.2924	000	7.3140	000
1155.0	7.2441	000	7.2425	000	7.2712	000	7.2733	000	7.2754	000	7.2774	000	7.2789	000	7.2794	000	7.3008	000
1165.0	7.2312	000	7.2298	001	7.2580	000	7.2601	000	7.2622	000	7.2642	000	7.2657	000	7.2663	000	7.2876	000
1175.0	7.2184	001	7.2172	001	7.2450	000	7.2470	000	7.2490	000	7.2511	000	7.2526	001	7.2533	001	7.2746	000
1185.0	7.2061	000	7.2050	000	7.2321	000	7.2341	000	7.2361	000	7.2383	000	7.2399	000	7.2407	000	7.2616	000
1195.0	7.1937	000	7.1929	000	7.2193	000	7.2213	000	7.2233	000	7.2255	000	7.2277	000	7.2281	000	7.2488	000
1205.0	7.1814	000	7.1807	000	7.2066	000	7.2085	000	7.2106	000	7.2127	000	7.2145	000	7.2156	000	7.2361	000
1215.0	7.1691	000	7.1686	000	7.1940	000	7.1959	000	7.1979	000	7.2001	000	7.2020	000	7.2031	000	7.2234	000
1225.0	7.1569	000	7.1566	000	7.1815	000	7.1833	000	7.1853	000	7.1876	000	7.1895	000	7.1907	000	7.2108	000
1235.0	7.1448	000	7.1446	000	7.1691	000	7.1708	000	7.1728	000	7.1751	000	7.1771	000	7.1784	000	7.1984	000
1245.0	7.1328	000	7.1328	000	7.1567	000	7.1584	000	7.1604	000	7.1627	000	7.1648	000	7.1662	000	7.1860	000
1255.0	7.1208	000	7.1207	001	7.1445	000	7.1461	000	7.1481	000	7.1504	000	7.1525	000	7.1539	000	7.1736	000
1265.0	7.1077	003	7.1072	005	7.1323	000	7.1339	000	7.1359	000	7.1380	001	7.1394	002	7.1399	005	7.1614	000
1275.0	7.0841	030	7.0802	039	7.1193	002	7.1196	005	7.1193	010	7.1183	018	7.1163	027	7.1126	039	7.1486	002
1285.0	7.0357	108	7.0299	121	7.0898	041	7.0850	055	7.0800	071	7.0745	087	7.0687	104	7.0621	121	7.1211	037
1295.0	7.0711	006	7.0703	010	7.0963	000	7.0978	000	7.0993	001	7.1010	003	7.1021	005	7.1022	009	7.1253	000
1305.0	7.0620	000	7.0624	002	7.0845	000	7.0859	000	7.0879	000	7.0903	000	7.0926	000	7.0940	001	7.1134	000
1315.0	7.0507	000	7.0517	000	7.0727	000	7.0741	000	7.0761	000	7.0785	000	7.0809	000	7.0828	000	7.1016	000
1325.0	7.0393	000	7.0405	000	7.0610	000	7.0624	000	7.0644	000	7.0668	000	7.0692	000	7.0713	000	7.0899	000
1335.0	7.0279	000	7.0293	000	7.0494	000	7.0508	000	7.0527	000	7.0552	000	7.0577	000	7.0597	000	7.0783	000
1345.0	7.0166	000	7.0181	000	7.0379	000	7.0392	000	7.0412	000	7.0436	000	7.0461	000	7.0483	000	7.0667	000
1355.0	7.0054	000	7.0070	000	7.0265	000	7.0277	000	7.0297	000	7.0322	000	7.0347	000	7.0369	000	7.0553	000
1365.0	6.9942	000	6.9959	000	7.0151	000	7.0163	000	7.0183	000	7.0208	000	7.0233	000	7.0256	000	7.0438	000
1375.0	6.9831	000	6.9849	000	7.0038	000	7.0050	000	7.0069	000	7.0095	000	7.0120	000	7.0144	000	7.0325	000
1385.0	6.9721	000	6.9740	000	6.9926	000	6.9938	000	6.9957	000	6.9982	000	7.0008	000	7.0032	000	7.0213	000
1395.0	6.9612	000	6.9632	000	6.9815	000	6.9826	000	6.9845	000	6.9870	000	6.9897	000	6.9921	000	7.0101	000
1405.0	6.9503	000	6.9524	000	6.9704	000	6.9715	000	6.9734	000	6.9759	000	6.9786	000	6.9811	000	6.9990	000
1415.0	6.9395	000	6.9417	000	6.9594	000	6.9604	000	6.9623	000	6.9649	000	6.9676	000	6.9701	000	6.9879	000
1425.0	6.9288	000	6.9311	000	6.9484	000	6.9495	000	6.9514	000	6.9540	000	6.9567	000	6.9593	000	6.9769	000
1435.0	6.9181	000	6.9205	000	6.9376	000	6.9386	000	6.9405	000	6.9431	000	6.9458	000	6.9484	000	6.9661	000
1445.0	6.9074	000	6.9099	000	6.9268	000	6.9278	000	6.9296	000	6.9322	000	6.9350	000	6.9377	000	6.9552	000
1454.4	6.8975	000	6.9001	000	6.9166	000	6.9176	000	6.9195	000	6.9221	000	6.9249	000	6.9276	000	6.9451	000
1464.4	6.8887	054	6.8911	050	6.9089	049	6.9104	052	6.9121	053	6.9141	054	6.9166	053	6.9188	052	6.9365	044
1475.0	6.8777	054	6.8802	050	6.8977	049												

LAMBDA (NM)	10000 2.50,-2.00	10000 3.00,-2.00	10000 3.50,-2.00	10000 4.00,-2.00	10000 4.50,-2.00
22.9	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
23.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
24.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
25.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
25.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
26.0	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
26.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
27.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
28.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
29.3	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
30.1	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
30.9	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
32.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
34.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
35.1	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
35.6	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
36.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
37.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
38.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
40.0	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
41.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
42.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
44.5	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
47.2	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
49.4	0.0000 000	0.0000 000	0.0000 000	0.0000 000	0.0000 000
50.6	-3.1803 005	-3.0713 006	-3.0845 003	-2.6779 008	-3.1813 002
51.6	-2.8841 007	-2.7803 003	-2.7931 001	-2.3978 003	-2.8899 000
54.0	-2.2718 000	-2.1295 000	-2.1397 000	-1.7832 000	-2.2349 000
56.4	-1.6186 000	-1.5365 000	-1.5432 000	-1.2231 000	-1.6360 000
58.7	-1.0890 000	-1.0151 000	-1.0188 000	-.7300 000	-1.1087 000
61.2	-.5608 000	-.4944 000	-.4951 000	-.2364 000	-.5819 000
64.0	-.0211 000	.0383 000	.0404 000	.2702 000	-.0428 000
67.1	.5205 000	.5735 000	.5782 000	.7810 000	.4989 000
70.5	1.0557 000	1.1030 000	1.1101 000	1.2883 000	1.0347 000
73.6	1.4971 000	1.5402 000	1.5489 000	1.7087 000	1.4769 000
77.0	1.9368 000	1.9760 000	1.9861 000	2.1291 000	1.9175 000
81.0	2.4023 000	2.4377 000	2.4490 000	2.5760 000	2.3841 000
85.0	2.8194 000	2.8518 000	2.8639 000	2.9779 000	2.8023 000
89.0	3.1947 000	3.2246 000	3.2373 000	3.3407 000	3.1787 000
92.0	4.09871000	4.06801000	4.03201000	4.07231000	3.96651000
94.0	4.61321000	4.50261000	4.43121000	4.40321000	4.34931000
96.2	6.2670 996	5.16181000	4.82011000	4.73281000	4.65681000
98.7	7.9962 774	7.7154 897	7.1697 972	6.3470 996	5.4024 999
101.2	7.9017 821	7.5757 925	6.9774 982	6.1355 997	5.38661000
103.7	7.8939 825	7.5864 923	7.0462 979	6.2916 996	5.5305 999
106.2	8.4851 323	8.4526 430	8.3271 589	8.0902 755	7.6704 899
108.7	8.5404 234	8.5609 264	8.5254 334	8.4364 444	8.2448 613
111.2	8.6196 227	8.6692 243	8.6860 288	8.6681 367	8.5948 502
113.7	8.6167 231	8.6573 254	8.6649 309	8.6361 397	8.5473 541
116.2	8.6193 223	8.6346 283	8.6019 390	8.5115 537	8.3173 723
118.7	8.4615 456	8.3647 609	8.1665 772	7.8642 893	7.3719 968
121.0	7.1956 970	6.5779 994	6.1213 998	6.0025 998	5.9261 999
122.9	8.0243 799	7.6754 918	7.1361 978	6.5881 994	6.2795 997
125.4	8.5726 298	8.5310 417	8.4168 584	8.2258 748	7.9048 888
128.5	8.6732 107	8.6881 148	8.6771 225	8.6337 339	8.5327 512
131.2	8.6735 097	8.6988 113	8.7100 147	8.7040 204	8.6733 308
133.7	8.6909 051	8.7166 060	8.7329 082	8.7383 119	8.7313 190
136.2	8.6721 080	8.6985 083	8.7186 093	8.7306 115	8.7368 160
138.7	8.6742 064	8.6989 065	8.7194 072	8.7342 086	8.7469 119
141.0	8.6724 056	8.6964 054	8.7175 057	8.7343 066	8.7516 089
143.3	8.6710 047	8.6925 046	8.7122 049	8.7288 058	8.7474 077
145.7	8.6672 041	8.6874 040	8.7070 041	8.7244 047	8.7449 062
148.2	8.6616 039	8.6798 038	8.6982 039	8.7154 044	8.7369 056
150.7	8.6594 028	8.6771 024	8.6966 021	8.7165 019	8.7434 019
153.2	8.6462 042	8.6632 036	8.6827 031	8.7031 027	8.7311 025
155.7	8.6264 068	8.6407 066	8.6581 064	8.6770 062	8.7033 063
158.2	8.6286 048	8.6415 045	8.6581 042	8.6767 041	8.7026 042
160.8	8.6266 035	8.6380 032	8.6538 030	8.6721 028	8.6981 028
163.5	8.6057 063	8.6157 060	8.6308 057	8.6492 055	8.6753 055
166.3	8.5893 079	8.5986 075	8.6133 072	8.6312 071	8.6566 071
168.8	8.5918 057	8.5997 054	8.6137 051	8.6319 049	8.6578 048
171.2	8.5776 072	8.5858 066	8.6003 061	8.6192 057	8.6455 054
173.7	8.5807 048	8.5874 044	8.6009 040	8.6191 036	8.6451 034
176.2	8.5798 033	8.5845 031	8.5964 030	8.6132 029	8.6378 030
178.7	8.5738 030	8.5781 027	8.5899 024	8.6071 023	8.6321 022
181.5	8.5575 047	8.5624 041	8.5748 036	8.5925 033	8.6174 032
184.0	8.5524 042	8.5561 037	8.5674 034	8.5847 031	8.6090 031
186.2	8.5477 038	8.5515 032	8.5632 027	8.5808 023	8.6057 021
189.2	8.5441 027	8.5463 022	8.5569 019	8.5740 016	8.5982 015
192.0	8.5368 025	8.5386 020	8.5492 016	8.5664 013	8.5907 011
194.0	8.5332 020	8.5335 018	8.5427 016	8.5590 015	8.5823 015
196.4	8.5311 010	8.5310 007	8.5399 006	8.5560 005	8.5791 004
198.9	8.5196 020	8.5200 015	8.5294 012	8.5461 010	8.5694 009
201.2	8.5052 039	8.5056 033	8.5151 029	8.5321 026	8.5553 024
203.7	8.4997 036	8.4993 031	8.5081 028	8.5246 026	8.5473 025
206.3	8.4909 040	8.4905 035	8.4994 031	8.5160 029	8.5385 028

LAMBDA (NM)	10000 2.50,-2.00	10000 3.00,-2.00	10000 3.50,-2.00	10000 4.00,-2.00	10000 4.50,-2.00
208.8	8.4918 024	8.4907 020	8.4990 017	8.5153 015	8.5373 014
211.2	8.4865 022	8.4846 019	8.4923 017	8.5082 016	8.5297 015
213.7	8.4740 036	8.4730 031	8.4814 027	8.4981 023	8.5199 022
216.2	8.4676 037	8.4659 032	8.4739 029	8.4901 026	8.5115 025
218.7	8.4647 031	8.4623 027	8.4701 023	8.4863 021	8.5075 019
221.2	8.4495 051	8.4480 045	8.4560 041	8.4725 037	8.4934 036
223.7	8.4485 040	8.4471 034	8.4552 029	8.4718 025	8.4928 023
226.2	8.4322 063	8.4310 057	8.4389 052	8.4555 048	8.4762 046
228.7	8.4364 047	8.4343 037	8.4414 033	8.4573 031	8.4773 030
231.2	8.4330 037	8.4312 031	8.4384 027	8.4544 024	8.4742 023
233.7	8.4165 067	8.4144 056	8.4213 053	8.4370 050	8.4563 050
236.2	8.4068 071	8.4053 065	8.4126 060	8.4287 056	8.4481 055
238.7	8.3956 084	8.3948 076	8.4025 070	8.4189 066	8.4380 064
241.2	8.3972 070	8.3960 062	8.4034 057	8.4196 053	8.4384 051
243.7	8.3948 064	8.3935 057	8.4006 052	8.4168 048	8.4355 046
246.2	8.3879 069	8.3865 061	8.3934 056	8.4093 053	8.4276 051
248.7	8.3849 065	8.3825 059	8.3885 056	8.4036 054	8.4208 054
250.6	8.3883 050	8.3856 045	8.3915 041	8.4065 039	8.4237 039
251.9	8.3877 046	8.3839 043	8.3886 042	8.4025 043	8.4184 045
253.7	8.3638 090	8.3622 083	8.3686 078	8.3840 075	8.4011 074
256.2	8.3788 048	8.3761 043	8.3818 039	8.3968 037	8.4138 036
258.7	8.3754 045	8.3720 042	8.3771 039	8.3917 038	8.4081 037
261.2	8.3699 048	8.3671 043	8.3725 040	8.3872 037	8.4036 036
263.7	8.3722 033	8.3688 029	8.3736 027	8.3879 026	8.4039 025
266.2	8.3737 020	8.3699 017	8.3744 015	8.3884 014	8.4042 014
268.7	8.3694 020	8.3655 017	8.3699 016	8.3838 015	8.3992 014
271.2	8.3618 027	8.3583 024	8.3628 022	8.3767 021	8.3918 020
273.7	8.3503 044	8.3467 041	8.3509 039	8.3645 038	8.3791 039
276.2	8.3500 035	8.3467 032	8.3511 030	8.3649 028	8.3797 027
278.7	8.3473 032	8.3438 029	8.3478 028	8.3611 027	8.3752 027
281.2	8.3515 014	8.3474 012	8.3511 011	8.3641 010	8.3780 011
283.7	8.3433 023	8.3399 020	8.3439 018	8.3572 017	8.3712 016
286.2	8.3379 026	8.3344 023	8.3383 022	8.3515 020	8.3653 020
288.7	8.3391 015	8.3354 013	8.3389 011	8.3518 010	8.3653 010
291.2	8.3400 004	8.3356 003	8.3388 003	8.3513 002	8.3645 002
293.7	8.3303 017	8.3264 016	8.3296 015	8.3422 014	8.3552 014
296.2	8.3303 009	8.3262 007	8.3294 007	8.3417 006	8.3545 006
298.7	8.3272 007	8.3231 006	8.3261 005	8.3383 005	8.3508 005
301.2	8.3258 001	8.3213 001	8.3239 002	8.3357 002	8.3478 002
303.7	8.3222 001	8.3178 001	8.3203 001	8.3322 001	8.3442 001
306.2	8.3181 007	8.3137 002	8.3162 002	8.3279 002	8.3398 002
308.7	8.3140 003	8.3097 003	8.3121 003	8.3237 003	8.3353 003
311.2	8.3098 004	8.3057 004	8.3082 003	8.3198 003	8.3314 003
313.7	8.3066 003	8.3025 002	8.3050 002	8.3164 002	8.3278 002
316.2	8.3030 003	8.2988 003	8.3011 003	8.3124 002	8.3236 002
318.7	8.2980 006	8.2941 005	8.2963 005	8.3076 005	8.3185 005
321.2	8.2960 007	8.2919 002	8.2940 002	8.3051 002	8.3159 002
323.7	8.2914 005	8.2873 004	8.2894 004	8.3004 004	8.3110 004
326.2	8.2889 007	8.2849 002	8.2869 002	8.2978 002	8.3082 002
328.7	8.2856 001	8.2816 001	8.2836 001	8.2943 001	8.3046 001
331.2	8.2824 001	8.2783 001	8.2802 001	8.2908 001	8.3010 000
333.7	8.2779 003	8.2739 003	8.2758 003	8.2863 002	8.2963 002
336.2	8.2743 003	8.2705 002	8.2723 002	8.2827 002	8.2926 002
338.7	8.2714 001	8.2674 001	8.2692 001	8.2795 001	8.2891 001
341.2	8.2678 001	8.2640 001	8.2657 001	8.2758 001	8.2853 001
343.7	8.2646 000	8.2607 000	8.2624 000	8.2724 000	8.2817 000
346.2	8.2610 000	8.2572 000	8.2588 000	8.2688 000	8.2780 000
348.7	8.2575 000	8.2537 000	8.2553 000	8.2651 000	8.2741 000
351.2	8.2540 000	8.2502 000	8.2518 000	8.2615 000	8.2703 000
353.7	8.2506 000	8.2468 000	8.2483 000	8.2579 000	8.2667 000
356.2	8.2470 000	8.2432 000	8.2447 000	8.2542 000	8.2628 000
358.7	8.2434 000	8.2397 000	8.2411 000	8.2505 000	8.2590 000
361.2	8.2398 000	8.2362 000	8.2375 000	8.2468 000	8.2551 000
363.6	8.2359 001	8.2323 001	8.2336 001	8.2428 002	8.2510 002
366.1	8.2518 695	8.2522 705	8.2519 712	8.2586 709	8.2635 709
368.7	8.2564 686	8.2364 710	8.2295 721	8.2386 717	8.2494 713
371.2	8.3910 565	8.3291 635	8.2795 681	8.2565 699	8.2438 711
373.7	8.5284 397	8.4563 501	8.3886 582	8.3448 624	8.3103 657
376.2	8.5303 379	8.4766 468	8.4144 548	8.3575 606	8.3073 652
378.7	8.6213 220	8.5856 303	8.5319 397	8.4680 482	8.4044 557
381.2	8.6668 119	8.6493 179	8.6154 256	8.5642 341	8.5030 434
383.7	8.5889 251	8.5528 330	8.5012 417	8.4409 495	8.3805 565
386.2	8.6988 018	8.7028 037	8.6956 071	8.6713 125	8.6308 211
388.7	8.5732 257	8.5374 330	8.4876 414	8.4306 488	8.3733 556
391.2	8.6847 017	8.6879 035	8.6815 067	8.6602 116	8.6271 189
393.7	8.6804 009	8.6888 016	8.6906 030	8.6810 055	8.6624 104
396.2	8.5696 219	8.5483 275	8.5168 338	8.4761 400	8.4287 467
398.7	8.6468 051	8.6400 089	8.6218 142	8.5913 203	8.5520 279
401.2	8.6606 003	8.6700 007	8.6750 013	8.6716 024	8.6650 048
403.7	8.6532 003	8.6631 005	8.6692 009	8.6682 014	8.6664 028
406.2	8.6462 003	8.6549 007	8.6593 014	8.6552 026	8.6473 053
408.7	8.6108 065	8.6007 108	8.5804 163	8.5492 224	8.5099 297
411.2	8.5350 207	8.5153 254	8.4867 313	8.4500 371	8.4069 436
413.7	8.6225 007	8.6305 011	8.6335 020	8.6277 037	8.6168 069
416.2	8.6181 001	8.6274 001	8.6329 005	8.6324 009	8.6321 019
418.7	8.6111 000	8.6205 000	8.6267 002	8.6269 004	8.6288 009

LAMBDA (NM)	10000 2.50,-2.00	10000 3.00,-2.00	10000 3.50,-2.00	10000 4.00,-2.00	10000 4.50,-2.00
421.2	8.6040 000	8.6132 000	8.6199 000	8.6200 003	8.6224 007
423.7	8.5967 000	8.6058 000	8.6122 001	8.6123 004	8.6145 008
426.2	8.5896 000	8.5984 001	8.6039 003	8.6041 006	8.6054 011
428.7	8.5825 000	8.5902 003	8.5950 006	8.5937 012	8.5917 026
431.2	8.5721 008	8.5769 017	8.5761 033	8.5654 059	8.5474 105
433.7	8.4497 239	8.4172 308	8.3768 378	8.3346 437	8.2919 495
436.2	8.5519 027	8.5501 044	8.5400 079	8.5187 126	8.4891 191
438.7	8.5533 003	8.5601 006	8.5642 010	8.5617 019	8.5576 037
441.2	8.5476 000	8.5553 001	8.5602 003	8.5601 006	8.5612 012
443.7	8.5406 000	8.5483 000	8.5541 001	8.5543 003	8.5568 006
446.2	8.5327 003	8.5404 002	8.5463 002	8.5476 002	8.5503 005
448.7	8.5252 004	8.5327 004	8.5386 004	8.5400 003	8.5431 005
451.2	8.5198 001	8.5271 001	8.5328 001	8.5340 001	8.5378 001
453.7	8.5131 001	8.5202 001	8.5258 001	8.5270 001	8.5308 001
456.2	8.5064 001	8.5134 000	8.5189 000	8.5201 000	8.5238 000
458.7	8.4996 001	8.5065 001	8.5119 000	8.5131 000	8.5168 000
461.2	8.4931 000	8.4998 000	8.5051 000	8.5063 000	8.5100 000
463.7	8.4863 000	8.4929 000	8.4981 000	8.4994 000	8.5031 000
466.2	8.4797 000	8.4861 000	8.4913 000	8.4925 000	8.4962 000
468.7	8.4730 000	8.4793 000	8.4844 000	8.4856 000	8.4890 001
471.2	8.4658 001	8.4721 001	8.4771 001	8.4782 001	8.4808 004
473.7	8.4597 000	8.4657 000	8.4706 001	8.4715 001	8.4738 004
476.2	8.4533 000	8.4592 000	8.4640 000	8.4640 003	8.4662 006
478.7	8.4466 000	8.4523 000	8.4560 003	8.4558 006	8.4565 013
481.2	8.4396 001	8.4440 004	8.4468 009	8.4444 017	8.4404 034
483.7	8.4277 014	8.4268 028	8.4200 054	8.4045 089	8.3820 143
486.2	8.3091 238	8.2751 304	8.2361 371	8.2001 422	8.1665 470
488.7	8.4145 014	8.4131 029	8.4060 055	8.3903 091	8.3677 145
491.2	8.4132 003	8.4173 005	8.4200 009	8.4177 017	8.4141 034
493.7	8.4079 000	8.4130 000	8.4163 003	8.4162 006	8.4171 012
496.2	8.4015 000	8.4065 000	8.4109 000	8.4110 003	8.4133 006
498.7	8.3951 000	8.4001 000	8.4045 000	8.4056 000	8.4079 003
502.5	8.3852 001	8.3901 000	8.3945 000	8.3957 000	8.3991 001
507.5	8.3727 000	8.3775 000	8.3808 000	8.3830 000	8.3837 000
512.5	8.3602 000	8.3648 000	8.3681 000	8.3702 000	8.3710 000
517.5	8.3477 000	8.3522 000	8.3554 000	8.3575 000	8.3583 000
522.5	8.3355 000	8.3398 000	8.3429 000	8.3451 000	8.3459 000
527.5	8.3232 000	8.3274 000	8.3304 000	8.3326 000	8.3334 000
532.5	8.3111 000	8.3151 000	8.3180 000	8.3203 000	8.3211 000
537.5	8.2991 000	8.3029 000	8.3058 000	8.3080 000	8.3089 000
542.5	8.2871 000	8.2908 000	8.2936 000	8.2959 000	8.2968 000
547.5	8.2752 000	8.2788 000	8.2815 000	8.2838 000	8.2847 000
552.5	8.2634 000	8.2669 000	8.2696 000	8.2719 000	8.2728 000
557.5	8.2517 000	8.2550 000	8.2577 000	8.2600 000	8.2609 000
562.5	8.2401 000	8.2433 000	8.2459 000	8.2482 000	8.2492 000
567.5	8.2285 000	8.2316 000	8.2342 000	8.2365 000	8.2375 000
572.5	8.2171 000	8.2200 000	8.2225 000	8.2249 000	8.2259 000
577.5	8.2057 000	8.2085 000	8.2110 000	8.2134 000	8.2144 000
582.5	8.1944 000	8.1971 000	8.1995 000	8.2020 000	8.2030 000
587.5	8.1831 000	8.1858 000	8.1882 000	8.1906 000	8.1917 000
592.5	8.1720 000	8.1746 000	8.1769 000	8.1793 000	8.1805 000
597.5	8.1609 000	8.1634 000	8.1656 000	8.1682 000	8.1693 000
602.5	8.1499 000	8.1523 000	8.1545 000	8.1570 000	8.1582 000
607.5	8.1389 000	8.1413 000	8.1435 000	8.1460 000	8.1472 000
612.5	8.1281 000	8.1303 000	8.1325 000	8.1351 000	8.1363 000
617.5	8.1173 000	8.1194 000	8.1216 000	8.1242 000	8.1254 000
622.5	8.1065 000	8.1086 000	8.1107 000	8.1134 000	8.1146 000
627.5	8.0959 000	8.0979 000	8.1000 000	8.1026 000	8.1039 000
632.5	8.0853 000	8.0872 000	8.0893 000	8.0920 000	8.0932 000
637.5	8.0748 000	8.0767 000	8.0787 000	8.0814 000	8.0827 000
642.5	8.0643 000	8.0661 000	8.0681 000	8.0708 000	8.0715 002
647.5	8.0539 000	8.0557 000	8.0571 001	8.0589 004	8.0588 007
652.5	8.0415 005	8.0408 010	8.0385 020	8.0351 034	8.0271 055
657.5	7.9905 094	7.9785 122	7.9639 155	7.9501 187	7.9333 220
662.5	8.0229 001	8.0238 002	8.0244 005	8.0252 010	8.0229 018
667.5	8.0129 000	8.0145 000	8.0164 000	8.0188 001	8.0191 004
672.5	8.0030 000	8.0045 000	8.0064 000	8.0092 000	8.0106 000
677.5	7.9930 000	7.9944 000	7.9963 000	7.9991 000	8.0006 000
682.5	7.9830 000	7.9844 000	7.9863 000	7.9892 000	7.9907 000
687.5	7.9731 000	7.9745 000	7.9763 000	7.9792 000	7.9808 000
692.5	7.9633 000	7.9646 000	7.9664 000	7.9694 000	7.9709 000
697.5	7.9535 000	7.9548 000	7.9566 000	7.9596 000	7.9612 000
702.5	7.9438 000	7.9451 000	7.9468 000	7.9498 000	7.9514 000
707.5	7.9342 000	7.9354 000	7.9371 000	7.9401 000	7.9418 000
715.0	7.9198 000	7.9210 000	7.9227 000	7.9257 000	7.9274 000
725.0	7.9008 000	7.9019 000	7.9036 000	7.9067 000	7.9084 000
735.0	7.8821 000	7.8831 000	7.8848 000	7.8879 000	7.8896 000
745.0	7.8635 000	7.8645 000	7.8661 000	7.8692 000	7.8710 000
755.0	7.8452 000	7.8461 000	7.8477 000	7.8509 000	7.8527 000
765.0	7.8271 000	7.8279 000	7.8295 000	7.8327 000	7.8346 000
775.0	7.8090 000	7.8099 000	7.8114 000	7.8146 000	7.8165 000
785.0	7.7914 000	7.7922 000	7.7937 000	7.7969 000	7.7989 000
795.0	7.7738 000	7.7746 000	7.7761 000	7.7794 000	7.7813 000
805.0	7.7564 000	7.7572 000	7.7587 000	7.7619 000	7.7639 000
815.2	7.7389 000	7.7396 000	7.7411 000	7.7444 000	7.7464 000
825.2	7.7298 165	7.7315 170	7.7322 173	7.7353 169	7.7360 165

LAMBDA (NM)	10000 2.50,-2.00	10000 3.00,-2.00	10000 3.50,-2.00	10000 4.00,-2.00	10000 4.50,-2.00
835.0	7.7065 177	7.7102 177	7.7133 175	7.7180 168	7.7197 163
845.0	7.6983 159	7.6969 169	7.6976 172	7.7020 165	7.7040 159
855.0	7.6981 125	7.6891 150	7.6800 172	7.6793 175	7.6799 172
865.0	7.6946 097	7.6834 127	7.6701 157	7.6649 170	7.6624 173
875.0	7.6934 063	7.6859 087	7.6755 112	7.6679 130	7.6592 146
885.0	7.6765 063	7.6693 086	7.6587 112	7.6484 135	7.6355 159
895.0	7.6857 006	7.6864 012	7.6834 023	7.6772 040	7.6651 065
905.0	7.6459 057	7.6405 076	7.6327 097	7.6249 116	7.6142 136
915.0	7.6546 001	7.6565 004	7.6563 009	7.6539 018	7.6470 033
925.0	7.6119 060	7.6054 081	7.5958 105	7.5856 129	7.5727 154
935.0	7.6229 000	7.6257 000	7.6269 002	7.6271 005	7.6246 011
945.0	7.6068 000	7.6092 002	7.6099 004	7.6096 009	7.6060 017
955.0	7.5647 059	7.5580 080	7.5481 104	7.5372 130	7.5235 157
965.0	7.5754 000	7.5778 001	7.5787 003	7.5789 007	7.5760 014
975.0	7.5601 000	7.5628 000	7.5646 000	7.5664 000	7.5654 003
985.0	7.5447 000	7.5474 000	7.5492 000	7.5510 000	7.5501 003
995.0	7.5293 000	7.5315 001	7.5323 004	7.5326 007	7.5301 014
1005.0	7.4888 057	7.4822 077	7.4728 100	7.4625 125	7.4496 152
1015.0	7.4992 000	7.5013 002	7.5020 004	7.5023 008	7.4998 014
1025.0	7.4846 000	7.4870 000	7.4888 000	7.4909 000	7.4908 001
1035.0	7.4699 000	7.4723 000	7.4741 000	7.4761 000	7.4767 000
1045.0	7.4553 000	7.4577 000	7.4594 000	7.4616 000	7.4622 000
1055.0	7.4408 000	7.4431 000	7.4449 000	7.4471 000	7.4477 000
1065.0	7.4264 000	7.4287 000	7.4304 000	7.4325 000	7.4332 001
1075.0	7.4123 000	7.4145 000	7.4162 000	7.4183 000	7.4183 002
1085.0	7.3976 001	7.3991 003	7.3995 006	7.3996 011	7.3970 019
1095.0	7.3597 055	7.3535 073	7.3450 094	7.3362 117	7.3251 141
1105.0	7.3702 000	7.3720 001	7.3730 003	7.3740 006	7.3729 011
1115.0	7.3566 000	7.3586 000	7.3604 000	7.3628 000	7.3634 001
1125.0	7.3429 000	7.3450 000	7.3467 000	7.3491 000	7.3502 000
1135.0	7.3293 000	7.3313 000	7.3331 000	7.3355 000	7.3366 000
1145.0	7.3159 000	7.3179 000	7.3196 000	7.3221 000	7.3233 000
1155.0	7.3026 000	7.3045 000	7.3063 000	7.3088 000	7.3100 000
1165.0	7.2894 000	7.2912 000	7.2930 000	7.2955 000	7.2967 000
1175.0	7.2762 000	7.2781 000	7.2797 000	7.2823 000	7.2836 000
1185.0	7.2632 000	7.2651 000	7.2667 000	7.2693 000	7.2707 000
1195.0	7.2503 000	7.2521 000	7.2538 000	7.2564 000	7.2578 000
1205.0	7.2375 000	7.2393 000	7.2409 000	7.2436 000	7.2450 000
1215.0	7.2247 000	7.2265 000	7.2282 000	7.2309 000	7.2323 000
1225.0	7.2121 000	7.2138 000	7.2155 000	7.2182 000	7.2197 000
1235.0	7.1995 000	7.2012 000	7.2029 000	7.2056 000	7.2072 000
1245.0	7.1871 000	7.1888 000	7.1904 000	7.1932 000	7.1948 000
1255.0	7.1747 000	7.1764 000	7.1780 000	7.1808 000	7.1824 000
1265.0	7.1624 000	7.1641 000	7.1656 000	7.1679 001	7.1685 004
1275.0	7.1485 004	7.1484 008	7.1470 015	7.1457 024	7.1420 036
1285.0	7.1160 050	7.1111 064	7.1052 080	7.0998 097	7.0926 116
1295.0	7.1261 000	7.1275 000	7.1285 002	7.1303 004	7.1304 008
1305.0	7.1142 000	7.1157 000	7.1173 000	7.1202 000	7.1216 001
1315.0	7.1023 000	7.1038 000	7.1055 000	7.1083 000	7.1101 000
1325.0	7.0905 000	7.0921 000	7.0937 000	7.0965 000	7.0984 000
1335.0	7.0789 000	7.0803 000	7.0820 000	7.0849 000	7.0867 000
1345.0	7.0672 000	7.0687 000	7.0703 000	7.0732 000	7.0751 000
1355.0	7.0557 000	7.0571 000	7.0587 000	7.0617 000	7.0636 000
1365.0	7.0442 000	7.0457 000	7.0473 000	7.0502 000	7.0521 000
1375.0	7.0329 000	7.0343 000	7.0359 000	7.0388 000	7.0407 000
1385.0	7.0215 000	7.0229 000	7.0245 000	7.0275 000	7.0294 000
1395.0	7.0103 000	7.0117 000	7.0133 000	7.0162 000	7.0182 000
1405.0	6.9992 000	7.0005 000	7.0021 000	7.0050 000	7.0070 000
1415.0	6.9881 000	6.9894 000	6.9910 000	6.9939 000	6.9959 000
1425.0	6.9771 000	6.9784 000	6.9799 000	6.9829 000	6.9849 000
1435.0	6.9661 000	6.9674 000	6.9689 000	6.9719 000	6.9740 000
1445.0	6.9552 000	6.9565 000	6.9580 000	6.9610 000	6.9631 000
1454.4	6.9450 000	6.9463 000	6.9478 000	6.9508 000	6.9529 000
1464.4	6.9372 048	6.9389 049	6.9401 050	6.9429 050	6.9446 050
1475.0	6.9260 047	6.9277 049	6.9289 050	6.9316 050	6.9333 050
1485.0	6.9155 047	6.9172 048	6.9185 049	6.9212 049	6.9229 049
1495.0	6.9044 048	6.9066 048	6.9080 049	6.9109 048	6.9126 048
1510.0	6.8863 053	6.8889 051	6.8913 050	6.8949 048	6.8972 047
1530.0	6.8646 054	6.8666 054	6.8694 052	6.8736 049	6.8764 046
1550.0	6.8452 051	6.8467 052	6.8492 051	6.8534 048	6.8562 045
1570.0	6.8341 031	6.8331 037	6.8315 044	6.8327 048	6.8341 049
1590.0	6.8135 031	6.8115 040	6.8084 051	6.8085 056	6.8096 058
1610.0	6.7937 031	6.7915 040	6.7882 051	6.7879 058	6.7888 059
1630.0	6.7845 007	6.7838 013	6.7822 020	6.7823 026	6.7819 031
1650.0	6.7573 024	6.7564 030	6.7547 038	6.7546 044	6.7536 050
1670.0	6.7456 007	6.7452 012	6.7437 019	6.7431 026	6.7410 035
1690.0	6.7191 024	6.7180 030	6.7162 037	6.7158 044	6.7142 051
1800.0	6.6190 021	6.6208 020	6.6166 032	6.6196 032	6.6153 044
2700.0	5.9692 010	5.9706 009	5.9685 015	5.9711 014	5.9691 020
4000.0	5.3191 005	5.3199 004	5.3188 007	5.3209 005	5.3199 009
5000.0	4.9451 003	4.9455 002	4.9448 004	4.9466 003	4.9459 005
6500.0	4.5012 002	4.5012 001	4.5007 003	4.5022 002	4.5018 003
10000.0	3.7660 001	3.7656 000	3.7651 001	3.7662 001	3.7660 001
20000.0	2.5736 000	2.5730 000	2.5725 000	2.5730 000	2.5726 000

TABLE 8
BALMER LINE PROFILES

A. H α

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0	
5500	0.00	0.00	0.00	370	215	277	395	527	600	645	721	777	839	880	908	928	953	968	977	982	986	989	991	993	994	996	997	998	998	999	000
5500	0.50	0.00	0.00	334	231	257	406	550	630	676	751	799	860	896	921	938	959	972	979	985	988	991	993	994	995	996	997	998	998	999	000
5500	1.00	0.00	0.00	305	247	241	426	575	658	706	778	827	877	909	930	945	964	975	982	986	990	992	993	995	996	997	998	998	999	000	
5500	1.50	0.00	0.00	280	259	282	446	601	683	731	799	840	869	918	937	951	968	977	983	988	990	993	994	995	996	997	998	998	999	000	
5500	2.00	0.00	0.00	263	282	270	472	624	705	751	815	853	898	925	942	955	970	979	985	988	991	993	994	995	996	997	998	998	999	000	
5500	2.50	0.00	0.00	246	305	348	496	646	724	767	827	862	905	930	946	958	973	981	986	989	992	994	995	996	997	998	998	999	999	000	
5500	3.00	0.00	0.00	239	316	367	520	661	732	774	831	865	906	931	947	959	973	981	986	990	992	994	995	996	997	998	998	999	999	000	
5500	3.50	0.00	0.00	236	290	378	543	678	741	778	832	865	907	932	948	959	973	981	986	990	992	994	995	996	997	998	998	999	999	000	
5500	4.00	0.00	0.00	236	331	402	565	683	744	779	831	864	905	930	947	958	972	981	986	989	992	993	995	996	997	998	998	999	999	000	
5500	4.50	0.00	0.00	240	360	425	585	691	744	776	828	861	903	928	945	956	971	980	985	989	991	993	994	995	996	997	998	998	999	000	
5770	4.44	0.00	0.00	315	332	387	522	630	687	723	780	818	868	900	922	937	957	969	977	983	986	989	991	993	994	996	997	997	998	999	000
6000	0.50	0.00	0.00	497	205	249	355	469	534	575	649	702	777	827	863	889	925	947	961	971	978	982	986	988	990	993	995	996	997	998	999
6000	1.00	0.00	0.00	467	216	236	365	484	554	599	675	727	797	842	875	898	931	951	964	973	979	983	986	989	991	993	995	996	997	998	999
6000	1.50	0.00	0.00	440	274	254	380	500	575	621	698	748	813	855	884	906	935	953	966	974	980	984	987	989	991	993	995	996	997	998	999
6000	2.00	0.00	0.00	416	283	290	394	518	595	643	718	765	826	865	892	912	939	956	967	975	980	984	987	990	991	994	996	997	997	999	999
6000	2.50	0.00	0.00	402	266	303	412	535	611	660	732	777	834	871	897	916	941	957	968	975	981	985	987	990	991	994	995	997	997	999	999
6000	3.00	0.00	0.00	393	249	302	428	550	625	671	740	783	839	875	900	918	943	958	968	976	981	985	988	990	991	994	995	997	997	999	999
6000	3.50	0.00	0.00	386	263	326	447	566	635	678	743	785	840	876	901	920	944	959	969	976	981	985	988	990	991	994	995	997	997	999	999
6000	4.00	0.00	0.00	384	284	342	466	578	641	681	743	784	840	876	901	920	944	959	969	976	981	985	988	990	991	994	995	996	997	998	999
6000	4.50	0.00	0.00	389	308	363	484	585	643	680	740	781	836	873	899	918	943	958	968	975	980	984	987	989	991	993	995	996	997	998	999
6500	1.00	0.00	0.00	632	238	237	333	435	493	530	596	646	721	774	815	846	892	922	941	955	965	972	977	981	985	989	992	994	994	995	999
6500	1.50	0.00	0.00	616	283	347	345	446	506	545	614	663	735	784	822	851	893	921	941	954	964	971	976	981	984	989	992	994	994	995	999
6500	2.00	0.00	0.00	611	223	207	356	458	520	562	633	681	749	796	830	857	893	922	940	953	963	970	975	979	983	988	991	993	993	997	999
6500	2.50	0.00	0.00	603	195	270	371	470	533	576	646	693	758	802	834	859	896	921	939	952	961	969	974	979	982	987	991	993	994	997	999
6500	3.00	0.00	0.00	596	192	257	383	482	546	589	657	705	765	808	839	863	898	922	940	952	961	968	974	978	981	987	990	992	994	997	999
6500	3.50	0.00	0.00	587	201	284	399	495	557	598	664	709	769	811	842	866	901	924	941	953	962	969	974	978	981	986	990	992	994	997	999
6500	4.00	0.00	0.00	581	212	291	412	506	564	603	666	709	770	812	843	867	902	925	942	953	962	969	974	978	982	986	990	992	994	997	999
6500	4.50	0.00	0.00	582	254	321	428	514	568	604	664	707	767	810	842	866	902	925	941	953	962	969	974	978	981	986	990	992	994	996	999
7000	1.00	0.00	0.00	743	139	214	317	412	463	495	553	599	672	729	774	810	865	901	926	943	956	965	972	977	980	986	990	992	994	997	999
7000	1.50	0.00	0.00	764	191	202	322	415	467	501	560	605	675	729	771	806	858	894	919	938	951	961	968	974	978	984	988	991	993	996	999
7000	2.00	0.00	0.00	780	152	283	331	423	476	511	571	615	683	733	773	805	853	888	913	932	946	956	964	970	975	982	987	990	992	996	999
7000	2.50	0.00	0.00	794	149	254	344	433	486	522	583	626	690	738	775	805	851	884	909	927	942	952	961	967	973	980	985	989	991	995	998
7000	3.00	0.00	0.00	807	146	228	357	443	497	533	593	635	698	743	778	807	850	882	906	924	938	949	958	964	970	978	983	987	990	994	998
7000	3.50	0.00	0.00	813	155	236	370	455	507	542	601	642	703	747	781	808	850	881	904	922	936	947	955	962	968	976	982	986	989	994	998
7000	4.00	0.00	0.00	829	100	170	378	465	515	548	605	646	705	747	781	808	850	880	903	920	933	944	953	960	966	974	980	985	988	993	998
7000	4.50	0.00	0.00	823	204	284	398	474	521	553	608	647	705	747	781	808	850	880	903	920	933	944	952	959	965	974	980	984	988	993	998
7500	1.00	0.00	0.00	758	202	215	312	404	454	484	539	582	655	715	763	802	861	900	926	944	956	965	972	977	981	986	990	992	994	997	999
7500	1.50	0.00	0.00	824	188	233	316	405	454	485	539	581	650	705	750	787	843	882	910	930	945	956	964	971	975	982	987	990	992	996	998
7500	2.00	0.00	0.00	884	125	298	322	408	457	488	542	582	646	698	740	774	828	867	896	918	934	947	956	964	969	978	984	988	990	995	998
7500	2.50	0.00	0.00	950	218	188	326	411	458	490	543	581	649	699	729	761	814	853	883	906	924	937	948	957	964	974	980	985	988	993	998
7500	3.00	0.00	0.00																												

TABLE 8A—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.6	4.0	5.0	7.0
8500	1.00	0.00	.478	253	258	365	460	514	548	611	663	751	818	866	899	939	959	972	979	984	987	990	992	993	995	996	997	998	999	999		
8500	1.50	0.00	.665	245	231	348	432	480	511	565	606	675	735	785	826	884	920	943	958	968	975	980	983	986	990	993	994	996	997	999	999	
8500	2.00	0.00	.798	189	310	345	427	473	503	553	590	650	701	745	783	843	885	914	935	949	960	968	974	978	984	989	991	993	996	999	999	
8500	2.50	0.00	.946	151	274	345	423	468	498	545	578	633	678	717	751	807	850	882	907	925	940	951	959	966	976	982	986	989	994	998	998	
8500	3.00	0.00	1.108	135	179	337	421	465	494	538	569	619	660	696	727	778	819	852	878	899	916	930	941	950	963	973	979	984	991	997	997	
8500	3.50	0.00	1.275	120	127	253	410	461	490	533	562	608	646	679	708	756	795	827	853	875	893	908	921	932	948	960	969	976	986	995	995	
8500	4.00	0.00	1.429	131	153	321	422	464	491	531	558	601	636	666	693	737	776	806	832	854	872	888	902	914	932	947	958	966	980	994	999	
8500	4.50	0.00	1.560	171	223	359	429	469	493	531	557	597	630	658	684	727	762	792	817	838	856	873	886	899	919	934	947	957	974	991	999	
9000	1.50	0.00	.540	264	246	369	456	507	540	599	644	723	787	836	873	920	947	962	972	979	983	987	989	991	994	995	996	997	998	999	999	
9000	2.00	0.00	.689	242	310	360	442	489	520	571	609	672	728	775	815	873	911	936	952	963	971	977	981	984	989	992	994	995	997	999	999	
9000	2.50	0.00	.845	224	262	361	438	482	512	558	591	646	693	734	770	828	861	902	925	941	953	962	969	974	982	987	990	992	996	998	998	
9000	3.00	0.00	1.020	234	230	364	436	479	507	549	579	637	668	703	735	789	832	865	892	912	928	941	951	959	970	978	983	987	993	998	998	
9000	3.50	0.00	1.212	198	254	364	435	476	502	542	569	612	648	680	709	758	798	831	859	881	901	915	928	938	954	965	973	979	988	996	996	
9000	4.00	0.00	1.418	173	209	357	434	474	499	532	561	603	633	662	688	733	770	802	828	852	871	888	902	915	934	949	960	968	982	994	994	
9000	4.50	0.00	1.615	178	206	348	434	473	497	533	556	592	622	648	672	714	749	779	805	828	847	864	879	893	914	931	945	955	973	991	991	
9400	3.90	0.00	1.370	212	250	370	442	482	506	544	568	607	638	667	695	741	780	813	840	864	883	900	914	926	944	957	967	974	985	995	995	
9400	3.95	0.00	1.343	212	247	371	442	481	506	543	568	606	638	667	693	738	777	809	837	860	880	897	911	923	942	955	965	973	985	995	995	
9400	4.00	0.00	1.366	212	247	372	442	481	506	542	567	604	636	665	691	736	774	806	834	857	877	894	908	920	940	954	964	972	984	995	995	
9500	1.50	0.00	.437	272	382	387	484	540	578	643	694	775	835	878	908	944	963	974	981	985	989	991	993	994	996	997	997	998	999	999	999	
9500	2.00	0.00	.588	264	278	377	462	510	543	597	638	707	766	813	851	903	934	953	965	974	979	983	987	989	992	994	995	996	998	999	999	
9500	2.50	0.00	.742	252	203	376	453	498	528	576	610	667	717	761	798	856	896	924	943	956	965	972	977	981	987	990	993	994	997	999	999	
9500	3.00	0.00	.914	258	293	377	449	492	519	562	592	641	683	720	753	809	852	885	910	929	943	953	962	968	977	983	990	993	999	999	999	
9500	3.50	0.00	1.120	241	284	377	447	487	512	552	579	621	657	690	719	769	810	844	872	894	912	927	939	948	962	972	979	983	991	997	997	
9500	3.90	0.00	1.303	216	252	373	444	484	508	545	570	609	641	670	697	743	782	815	843	866	886	902	916	928	946	959	968	975	986	995	995	
9500	4.00	0.00	1.351	213	259	374	445	483	508	544	568	606	638	666	692	737	775	808	835	859	879	896	910	922	941	955	965	973	985	995	995	
9500	4.50	0.00	1.510	212	238	366	444	481	504	538	560	594	623	648	671	712	747	778	804	828	848	865	881	895	917	934	947	958	975	992	992	
10000	1.50	0.00	.371	304	281	414	515	575	618	688	740	817	870	906	930	958	973	981	986	989	992	993	994	995	997	997	998	998	999	999	999	
10000	2.00	0.00	.513	282	233	395	481	534	568	627	670	742	800	845	879	923	946	963	973	980	984	987	990	991	994	995	996	997	998	999	999	
10000	2.50	0.00	.648	273	296	392	469	517	548	597	633	694	746	790	827	882	917	940	955	966	973	978	982	985	990	992	994	996	997	999	999	
10000	3.00	0.00	.810	289	309	392	464	508	536	579	610	660	704	743	778	834	876	906	928	943	955	964	970	975	983	987	990	993	996	999	999	
10000	3.50	0.00	1.011	257	299	391	460	501	526	566	593	635	672	705	735	787	830	864	890	911	928	940	950	959	970	978	983	987	993	998	998	
10000	4.00	0.00	1.246	280	316	394	458	495	519	555	579	616	648	676	703	749	788	821	849	872	892	908	922	933	950	963	971	978	988	996	996	
10000	4.50	0.00	1.512	244	270	382	454	490	513	546	568	601	629	654	677	718	754	785	812	835	856	873	889	902	924	941	953	963	979	993	993	
10500	4.00	0.00	1.140	265	285	392	468	508	532	568	592	629	661	690	717	764	804	838	866	889	907	922	934	944	959	970	977	982	990	997	997	
11000	2.00	0.00	.406	318	284	429	521	581	620	685	730	799	850	887	914	947	965	975	982	986	989	991	993	994	996	997	998	998	999	999	999	
11000	2.50	0.00	.524	293	329	417	501	554	588	643	682	745	796	837	869	914	941	958	969	976	982	985	988	990	993	995	996	997	998	999	999	
11000	3.00	0.00	.661	280	314	413	492	539	569	616	649	703	749	789	822	874	909	933	949	961	969	975	980	983	988	991	993	995	997	999	999	
11000	3.50	0.00	.830	277	309	409	486	529	555	597	625	670	709	744	776	828	868	898	920	937	949	959	966	972	980	985	989	991	995	998	998	
11000	4.00	0.00	1.039	283	305	405	480	520	545	582	606	644	677	706	734	783	823	856	882	904	920	934	945	953	966	975	981	985	992	997	997	
11000	4.50	0.00	1.294	294	308	392	474	514	536	570	591	623	651	677	701	743	780	812	839	863	883	900	914	926	944	958	967	974	986	995	995	
11500	4.00	0.00	.954	299	323	417	493	534	560	597	621	660	693	724	752	800	840	871	896	915	931	943	952	960	971	979	984	988	993	998	998	
12000	2.00	0.00	.338	356	310	460	555	620	662	728	772	837	882	913	934	960	974	982	987	990	992	994	995	996	997	998	998	999	999	999	999	
12000	2.50	0.00	.443	333	364	446	532	590	626	684	723	784	831	867	895	932	954	968	976	982	986	989	991	993	995	996	997	998	999	999	999	
12000	3.00	0.00	.562	317	351	438	520	571	603	654	688	741	786	823	853	898	928	947	961	970	976	981	985	989	991	993	995	996	997	999	999	
12000	3.50	0.00	.707	309	341	432	512	558	587	631	660	706	745	780	810	858	894	919	938	951	961	969	974	979	985	989	992	994	996	999	999	
12000	4.00	0.00	.88																													

TABLE 8A—Continued

Table with columns: T EFF, LOG G, LOG A, WIDTH, and 16 columns of numerical data. The data is organized in rows of 17 columns each, starting with stellar parameters and followed by 16 columns of numerical values.

TABLE 8A—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
30000	3.50	0.00	.177	634	641	663	700	739	774	837	876	920	945	961	971	983	989	993	995	996	997	998	998	998	999	999	999	999	999	000
30000	4.00	0.00	.261	610	618	641	675	711	742	797	833	877	906	925	942	963	975	983	987	990	993	994	995	996	997	998	998	999	000	000
30000	4.50	0.00	.343	595	605	631	665	697	724	773	804	845	874	897	915	941	958	969	977	982	986	989	991	993	995	996	997	998	999	000
30000	5.00	0.00	.441	582	593	622	656	685	709	752	780	818	846	868	887	916	936	951	962	970	976	981	984	987	991	993	995	996	998	999
35000	3.50	0.00	.095	714	635	744	784	826	862	916	943	970	982	988	991	995	997	998	999	999	999	999	999	000	000	000	000	000	000	000
35000	4.00	0.00	.172	661	668	691	725	763	795	849	883	922	944	959	969	982	988	992	994	996	997	997	998	998	999	999	999	999	999	000
35000	4.50	0.00	.256	646	654	676	707	740	766	812	842	880	906	925	940	960	973	981	986	989	992	993	995	996	997	998	998	999	999	000
35000	5.00	0.00	.337	641	649	673	703	732	754	793	818	853	878	898	914	938	955	966	974	980	984	987	990	992	994	996	997	998	999	000
40000	4.00	0.00	.116	718	725	745	776	812	845	896	924	953	968	977	983	990	994	996	997	998	998	999	999	999	999	999	999	999	999	000
40000	4.50	0.00	.166	699	706	727	757	790	819	868	896	926	944	957	967	979	986	990	993	995	996	997	997	998	999	999	999	999	999	000
40000	5.00	0.00	.227	687	695	716	746	775	801	844	870	900	919	934	946	963	974	981	986	989	992	993	995	996	997	998	998	999	999	000
45000	4.50	0.00	.137	729	735	753	780	810	838	886	912	940	957	967	975	985	990	993	995	996	997	998	998	999	999	999	999	999	999	000
45000	5.00	0.00	.177	723	730	748	774	802	827	870	894	922	939	951	961	974	982	987	991	993	994	996	997	997	998	999	999	999	999	000
50000	4.50	0.00	.119	746	751	767	791	820	848	897	923	950	964	974	980	988	992	995	996	997	998	998	999	999	999	999	999	999	999	000
50000	5.00	0.00	.156	739	745	761	785	812	836	879	903	932	948	959	967	979	985	990	993	994	996	997	997	998	998	999	999	999	999	000
5500	2.00	-1.00	.239	288	294	469	622	702	748	817	858	907	935	952	963	977	984	989	992	994	995	996	997	997	998	999	999	999	999	000
5500	2.50	-1.00	.231	305	293	487	636	709	752	820	861	910	938	955	966	979	986	990	992	994	995	996	997	998	998	999	999	999	999	000
5500	3.00	-1.00	.226	322	347	506	642	708	751	818	860	911	938	955	966	979	986	990	993	994	996	996	997	998	998	999	999	999	999	000
5500	3.50	-1.00	.228	339	387	523	644	705	745	813	856	908	937	954	965	970	986	990	992	994	995	996	997	997	998	999	999	999	999	000
5500	4.00	-1.00	.236	355	403	538	644	699	738	805	849	902	932	951	962	971	984	988	992	994	995	996	997	997	998	998	999	999	999	000
5500	4.50	-1.00	.266	369	420	551	640	687	720	781	825	882	916	938	953	971	980	986	989	992	994	995	996	996	997	998	999	999	999	000
6000	2.00	-1.00	.381	240	329	423	534	608	656	731	779	839	877	903	922	947	962	972	979	983	987	989	991	993	995	996	997	998	999	000
6000	2.50	-1.00	.364	257	316	437	550	623	670	742	788	847	884	909	927	951	965	974	980	984	988	990	992	993	995	996	997	998	999	000
6000	3.00	-1.00	.353	277	339	451	562	631	675	745	790	850	887	912	930	953	967	975	981	985	988	991	992	994	995	997	997	998	999	000
6000	3.50	-1.00	.349	297	351	463	568	631	672	740	787	849	887	913	931	954	968	976	982	986	989	991	993	994	996	997	998	998	999	000
6000	4.00	-1.00	.353	315	368	473	570	626	664	732	780	845	885	912	930	954	968	976	982	986	989	991	992	994	995	997	997	998	999	000
6000	4.50	-1.00	.373	336	382	484	570	619	653	718	766	832	874	903	923	949	964	974	980	985	988	990	992	993	995	996	997	998	999	000
6500	2.00	-1.00	.560	203	366	391	481	538	579	648	697	764	810	843	869	905	930	947	959	967	974	978	982	985	989	992	994	995	997	999
6500	2.50	-1.00	.545	215	325	406	494	553	595	665	711	776	819	850	874	909	932	948	959	968	974	978	982	985	989	992	994	995	997	999
6500	3.00	-1.00	.530	234	329	422	506	566	607	675	721	783	825	856	879	912	934	949	960	968	974	979	982	985	989	992	994	995	997	999
6500	3.50	-1.00	.523	256	312	434	517	575	615	679	723	785	827	858	881	914	936	950	961	969	975	979	983	985	989	992	994	995	997	999
6500	4.00	-1.00	.517	279	339	446	526	579	615	676	720	783	826	858	882	916	937	952	962	970	975	980	983	986	990	992	994	995	997	999
6500	4.50	-1.00	.527	301	354	457	531	578	611	669	713	776	821	854	879	913	935	950	961	969	975	979	983	985	989	992	994	995	997	999
7000	2.00	-1.00	.742	189	324	364	449	495	527	585	629	696	746	784	815	861	894	918	936	949	959	966	972	977	983	987	990	993	996	999
7000	2.50	-1.00	.742	190	323	380	460	506	539	598	641	705	752	789	818	862	894	917	934	947	957	964	970	975	982	987	990	992	996	999
7000	3.00	-1.00	.749	203	269	394	472	518	552	610	652	713	757	792	820	862	893	915	931	944	954	962	968	973	980	985	989	991	995	998
7000	3.50	-1.00	.745	223	260	410	483	529	562	619	660	720	763	796	823	864	893	915	931	943	953	961	967	972	979	984	988	991	995	998
7000	4.00	-1.00	.739	246	304	422	495	538	570	625	665	723	766	799	826	866	895	916	931	944	953	960	966	971	979	984	988	990	994	998
7000	4.50	-1.00	.742	267	331	437	503	543	573	626	665	722	765	798	825	865	894	914	930	943	952	960	966	971	978	983	987	990	994	998
7500	2.00	-1.00	.860	189	321	354	432	474	502	552	591	654	704	745	779	832	871	899	920	936	948	958	965	970	979	984	988	991	995	998
7500	2.50	-1.00	.916	186	230	359	438	479	506	555	593	652	699	737	770	820	859	888	910	927	940	951	959	965	975	981	986	989	994	998
7500	3.00	-1.00	.952	195	213	376	448	488	515	563	599	656	701	737	767	815	852	880	902	920	933	944	953	960	971	978	983	987	993	996
7500	3.50	-1.00	.980	209	262	386	459	498	525	571	606	661	703	738	766	812	847	875	897	914	928	939	948	955	967	975	980	985	991	997
7500	4.00	-1.00	.991	231	288	405	471	508	534	579	613	666	707	740	768	812	846	873	894	911	925	936	945	953	964	973	979	983	990	997
7500	4.50	-1.00	1.010	257	304	416	481	516	541	584	617	669	709	741	768	811	844	870	891	907	921	932	942	950	962	970	977	982	990	996

TABLE 8A—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0	
8000	2.00	-1.00	.884	217	267	361	434	473	499	545	560	690	733	768	824	865	896	918	935	947	957	964	970	979	984	988	991	995	998		
8000	2.50	-1.00	.982	268	231	369	438	478	502	544	579	634	680	719	752	805	845	876	893	918	932	944	953	960	971	978	984	987	993	998	
8000	3.00	-1.00	1.076	210	247	366	441	478	503	544	575	626	669	705	736	786	826	857	883	903	919	932	942	951	964	973	979	984	991	997	
8000	3.50	-1.00	1.174	282	300	383	445	480	503	543	572	620	660	694	723	771	809	840	866	887	905	919	930	940	950	955	965	973	979	988	996
8000	4.00	-1.00	1.279	235	269	383	454	487	510	547	575	621	658	690	718	764	802	832	858	879	896	911	923	933	949	961	969	976	986	995	
8000	4.50	-1.00	1.268	255	294	405	464	496	517	553	580	624	660	690	717	762	798	828	852	873	891	905	917	928	944	956	965	972	984	994	
8500	2.00	-1.00	.821	219	246	364	443	480	506	551	586	646	697	740	778	837	879	909	930	946	957	965	972	976	983	988	991	993	996	999	
8500	2.50	-1.00	.965	216	232	361	441	478	503	542	576	630	675	714	748	804	846	878	903	922	937	948	957	964	974	981	985	989	994	998	
8500	3.00	-1.00	1.111	224	237	362	442	480	503	542	577	624	664	700	731	785	827	861	887	908	925	938	948	956	968	977	982	986	992	997	
8500	3.50	-1.00	1.255	235	238	368	436	481	505	548	578	613	650	683	711	759	798	829	855	876	894	909	921	932	948	960	969	975	986	995	
8500	4.00	-1.00	1.373	255	269	383	458	492	514	548	572	612	646	676	703	748	784	814	839	860	877	893	906	917	935	949	959	967	981	993	
8500	4.50	-1.00	1.465	273	282	372	464	502	523	555	578	615	647	675	700	742	777	805	829	849	866	881	894	906	924	939	950	960	975	991	
9000	2.00	-1.00	.688	272	303	396	465	502	527	574	609	671	725	771	810	869	908	933	950	961	970	976	980	984	988	991	993	995	997	999	
9000	2.50	-1.00	.856	267	294	393	458	494	518	559	590	643	690	731	766	824	867	899	922	939	951	960	967	973	981	986	989	992	995	998	
9000	3.00	-1.00	1.040	268	285	385	454	489	512	549	577	624	664	700	731	785	827	861	887	908	925	938	948	956	968	977	982	986	992	997	
9000	3.50	-1.00	1.237	273	282	362	454	487	508	542	568	609	645	677	705	754	794	827	858	877	896	911	924	935	951	963	972	978	988	994	
9000	4.00	-1.00	1.427	283	288	361	455	488	508	540	563	600	632	661	687	732	770	801	828	850	870	886	900	913	932	947	958	967	981	994	
9000	4.50	-1.00	1.594	299	305	379	456	491	511	542	563	596	626	652	676	717	753	782	808	830	849	866	881	894	915	931	945	955	973	991	
9500	2.00	-1.00	.587	307	336	420	491	528	555	604	642	708	764	811	848	900	931	951	964	972	978	983	986	988	992	994	995	996	998	999	
9500	2.50	-1.00	.742	302	327	412	479	514	538	580	613	668	716	759	795	853	893	921	940	954	964	971	976	980	986	990	992	994	997	999	
9500	3.00	-1.00	.925	305	321	405	472	506	527	564	593	640	681	718	751	806	849	882	907	926	940	951	960	966	976	982	987	990	994	998	
9500	3.50	-1.00	1.140	310	318	387	468	500	520	553	578	619	654	686	715	768	806	838	860	880	890	903	915	925	945	960	970	977	982	990	997
9500	4.00	-1.00	1.373	316	321	384	465	498	515	545	567	603	634	662	688	733	772	804	832	855	875	892	907	919	938	952	963	971	984	995	
9500	4.50	-1.00	1.600	326	330	393	461	493	512	541	560	592	620	645	668	710	746	777	803	826	847	864	880	893	915	933	946	957	974	991	
10000	2.00	-1.00	.509	340	339	439	514	555	583	634	674	742	798	842	876	920	946	962	972	979	983	987	989	991	994	995	996	997	998	999	
10000	2.50	-1.00	.645	335	358	434	501	538	563	606	639	696	746	789	825	879	915	938	954	964	972	978	982	985	989	992	994	995	997	999	
10000	3.00	-1.00	.808	344	366	434	494	527	549	586	615	663	706	743	777	832	874	904	926	942	954	962	969	975	982	987	990	992	996	999	
10000	3.50	-1.00	1.017	340	356	429	487	517	537	571	595	636	672	703	734	785	827	861	887	908	925	938	948	957	969	977	982	986	993	998	
10000	4.00	-1.00	1.257	354	373	432	483	510	528	559	581	616	647	675	701	747	785	818	846	870	889	906	919	931	948	961	970	977	987	996	
10000	4.50	-1.00	1.532	350	358	417	475	504	521	549	568	599	626	651	674	715	751	781	808	832	852	870	886	899	921	938	951	961	978	992	
5500	2.00	-2.00	.227	307	333	477	626	705	751	821	863	912	940	956	967	980	986	990	993	995	996	997	997	998	998	999	999	999	999	999	999
5500	2.50	-2.00	.220	324	332	491	634	706	750	821	865	915	942	958	969	981	987	991	993	995	996	997	997	998	998	999	999	999	999	999	999
5500	3.00	-2.00	.219	339	357	504	633	699	743	816	862	915	942	959	970	981	988	991	994	995	996	997	997	998	998	999	999	999	999	999	999
5500	3.50	-2.00	.225	354	395	513	628	688	732	807	855	910	939	957	968	981	987	991	993	995	996	997	997	998	998	999	999	999	999	999	999
5500	4.00	-2.00	.237	367	410	520	619	676	720	796	845	902	933	952	964	978	985	990	992	994	995	996	997	997	998	998	999	999	999	999	999
5500	4.50	-2.00	.280	382	417	527	606	652	687	756	807	873	912	936	952	970	980	986	989	992	994	995	996	996	997	998	999	999	999	999	999
6000	2.00	-2.00	.359	272	403	442	543	617	666	740	788	847	884	909	927	951	965	974	980	985	988	990	992	993	995	996	997	998	999	999	999
6000	2.50	-2.00	.342	291	366	454	538	632	679	751	797	855	891	915	933	955	968	977	982	986	989	991	993	994	996	997	998	998	999	999	999
6000	3.00	-2.00	.336	302	372	465	569	637	681	752	798	856	892	917	934	956	969	977	983	987	989	992	993	994	996	997	998	998	999	999	999
6000	3.50	-2.00	.331	333	381	475	572	632	673	743	792	855	894	919	937	958	971	979	984	988	990	992	993	995	996	997	998	998	999	999	999
6000	4.00	-2.00	.338	350	385	482	571	623	661	732	783	850	890	917	935	958	971	979	984	988	990	992	993	994	996	997	998	998	999	999	999
6000	4.50	-2.00	.344	371	407	490	566	612	647	714	764	833	877	906	927	952	967	976	982	986	989	991	992	994	995	997	997	998	999	999	999
6500	2.00	-2.00	.541	250	360	417	482	546	586	656	704	771	816	849	874	910	933	949	961	969	975	979	983	986	990	992	994	996	998	999	999
6500	2.50	-2.00	.521	266	329	434	505	562	603	673	720	784	826	857	881	914	936	951	962	970	975	980	983	986	990	992	994	996	998	999	999
6500	3.00	-2.00	.509	288	259	446	517	574	616	683	729	791	832	862	885	917	938	953	963	970	976	980	984	986	990	993	994	996	998	999	999
6500	3.50	-2.00	.494	312	367	459	528	584	622	687	731	793	835	865	888	920	940	955	964	971	977	981	984	987	990	993	994	996	998	999	999
6500	4.00	-2.0																													

TABLE 8A—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0	
7000	2.00	-2.00	.726	251	301	400	466	505	534	591	634	702	751	789	820	865	897	920	936	950	959	967	972	977	983	988	991	993	996	999	
7000	2.50	-2.00	.722	262	255	415	477	515	546	604	647	712	758	794	823	867	896	917	926	934	949	958	966	971	976	982	987	990	992	996	999
7000	3.00	-2.00	.717	281	330	434	498	527	560	617	659	721	765	799	826	858	897	919	935	947	956	964	970	974	981	986	989	992	995	998	
7000	3.50	-2.00	.712	305	343	444	499	539	571	628	668	728	771	804	830	870	899	919	935	946	955	963	969	973	980	985	988	991	995	998	
7000	4.00	-2.00	.703	330	376	461	509	548	578	633	672	731	773	806	833	872	900	920	936	947	956	963	969	973	980	985	988	991	995	998	
7000	4.50	-2.00	.703	354	388	470	516	553	581	633	672	730	772	805	832	872	900	920	935	947	956	963	969	973	980	985	988	991	995	998	
7500	2.00	-2.00	.853	269	241	392	450	483	508	555	592	655	705	746	780	823	872	900	921	937	949	958	965	971	979	984	988	991	995	998	
7500	2.50	-2.00	.898	277	307	401	458	489	513	560	596	655	705	746	772	823	861	889	911	928	941	951	959	966	975	981	986	989	994	998	
7500	3.00	-2.00	.923	294	321	417	469	499	523	568	604	661	705	742	772	819	856	883	905	922	936	946	955	962	972	979	984	987	993	996	
7500	3.50	-2.00	.944	318	347	436	481	510	533	578	612	667	709	744	772	817	852	879	901	917	931	942	950	957	968	976	981	985	992	997	
7500	4.00	-2.00	.950	342	362	448	494	520	543	586	620	673	714	747	775	819	852	878	899	915	929	939	948	955	966	974	980	984	991	997	
7500	4.50	-2.00	.965	366	393	465	502	528	549	591	624	676	716	748	774	817	850	876	896	912	925	936	945	953	964	972	978	983	990	997	
8000	2.00	-2.00	.887	292	296	395	448	478	501	545	580	639	689	731	767	823	864	894	917	933	946	956	964	971	976	983	987	990	993	996	999
8000	2.50	-2.00	.980	311	287	404	454	483	506	546	578	633	679	718	751	804	844	875	899	917	932	943	953	960	971	978	983	987	993	998	
8000	3.00	-2.00	1.067	310	328	405	459	486	507	545	575	626	669	705	736	786	826	858	883	903	919	932	943	951	964	973	979	984	991	997	
8000	3.50	-2.00	1.155	338	358	423	467	492	511	546	575	625	663	697	726	773	811	843	868	889	906	920	931	941	955	966	974	979	988	996	
8000	4.00	-2.00	1.195	344	363	435	479	501	518	552	579	624	662	694	722	768	806	836	862	882	900	914	926	936	951	962	970	977	981	993	
8000	4.50	-2.00	1.231	363	378	450	491	511	527	558	584	628	665	696	723	767	803	832	857	877	894	908	920	930	946	958	967	973	984	995	
8500	2.00	-2.00	.819	322	342	407	460	487	509	551	585	645	695	739	776	835	877	908	929	945	956	964	971	976	983	987	990	993	996	999	
8500	2.50	-2.00	.963	323	341	409	459	485	506	544	575	628	673	713	747	802	845	877	902	921	935	947	956	963	973	980	985	988	994	998	
8500	3.00	-2.00	1.107	330	343	409	463	488	507	542	570	618	659	694	726	778	818	850	876	897	914	927	938	948	961	971	978	983	990	997	
8500	3.50	-2.00	1.242	341	351	425	471	495	512	544	570	613	650	683	712	760	799	830	855	877	894	909	921	931	948	960	969	975	986	995	
8500	4.00	-2.00	1.355	356	366	437	482	504	520	549	573	613	648	678	705	756	786	816	841	861	879	894	907	918	935	949	959	967	981	993	
8500	4.50	-2.00	1.431	371	378	446	496	516	530	558	580	617	650	679	704	747	781	809	833	853	870	884	897	908	926	940	952	960	976	991	
9000	2.00	-2.00	.696	367	381	438	485	512	534	577	611	672	724	770	809	867	906	931	949	960	969	975	980	983	988	991	993	995	997	999	
9000	2.50	-2.00	.859	363	379	435	477	502	522	560	591	643	689	729	764	821	864	896	919	936	949	959	966	972	980	985	989	991	995	998	
9000	3.00	-2.00	1.043	360	376	435	473	497	515	549	576	622	663	698	730	783	825	859	885	906	923	936	947	955	967	976	982	986	992	997	
9000	3.50	-2.00	1.235	361	375	437	474	496	512	543	567	608	644	676	704	754	794	827	854	876	895	910	923	934	944	959	969	976	982	990	997
9000	4.00	-2.00	1.423	365	377	441	478	498	513	541	562	599	631	660	686	732	769	801	828	850	869	886	900	912	932	947	958	966	981	993	
9000	4.50	-2.00	1.582	372	382	442	485	504	518	543	563	596	625	652	676	718	754	784	809	831	850	867	881	894	915	931	945	955	973	990	
9500	2.00	-2.00	.588	399	409	463	510	536	559	604	641	705	761	807	844	897	929	949	962	971	978	982	985	988	991	994	995	996	998	999	
9500	2.50	-2.00	.743	397	414	462	500	523	544	582	613	667	714	756	792	850	890	919	936	952	962	970	975	980	985	989	992	994	996	999	
9500	3.00	-2.00	.929	392	411	462	493	516	533	566	593	639	680	716	748	803	846	879	904	923	938	949	958	965	975	982	986	989	994	996	
9500	3.50	-2.00	1.142	388	408	462	491	510	525	555	578	618	653	685	714	764	805	838	866	888	907	922	934	944	959	969	976	982	990	997	
9500	4.00	-2.00	1.376	386	401	461	490	506	520	547	568	602	633	661	687	732	771	803	830	854	874	891	905	917	937	951	962	970	983	994	
9500	4.50	-2.00	1.610	383	395	455	489	505	518	542	561	591	619	644	667	709	744	775	801	824	844	862	877	891	913	931	944	955	974	991	
10000	2.00	-2.00	.511	427	426	483	530	559	583	632	670	737	793	837	871	917	944	960	971	978	983	986	989	991	993	995	996	997	998	999	
10000	2.50	-2.00	.650	426	441	482	518	542	563	603	636	692	742	784	821	875	911	935	952	963	971	977	981	984	989	992	994	995	997	999	
10000	3.00	-2.00	.817	433	449	485	511	533	550	585	612	659	701	739	772	828	869	900	923	939	952	961	968	973	981	986	990	992	995	998	
10000	3.50	-2.00	1.029	418	439	484	507	525	540	570	593	633	669	701	730	781	823	857	884	905	922	935	946	955	967	976	982	986	992	997	
10000	4.00	-2.00	1.267	454	470	489	506	519	533	560	580	614	644	672	698	744	782	815	843	867	886	903	917	928	947	959	969	976	986	995	
10000	4.50	-2.00	1.542	400	413	472	501	514	527	551	569	598	625	649	672	713	749	779	806	830	850	868	884	897	920	937	950	960	977	992	

TABLE 8
B. H/B

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0	
5500	0.00	0.00	0.00	.291	140	209	432	583	659	702	770	814	873	909	933	950	970	980	986	990	993	995	996	997	997	998	999	999	999	000	
5500	1.00	0.00	0.00	.292	151	213	441	592	664	709	775	817	873	909	933	950	970	980	986	990	993	995	996	997	997	998	999	999	999	000	
5500	2.00	0.00	0.00	.287	162	234	458	604	675	719	782	823	876	910	932	948	968	979	985	989	992	994	995	996	997	998	999	999	999	000	
5500	3.00	0.00	0.00	.281	182	254	476	617	688	728	780	828	881	913	934	949	968	979	985	989	992	994	995	996	997	998	999	999	999	000	
5500	4.00	0.00	0.00	.270	191	274	495	631	695	737	789	837	887	918	938	952	970	980	986	990	992	994	995	996	997	998	999	999	999	000	
5500	5.00	0.00	0.00	.253	209	298	518	645	708	746	807	846	895	924	943	956	972	982	987	991	993	995	996	997	997	998	999	999	999	000	
5500	6.00	0.00	0.00	.242	224	322	535	654	713	752	812	851	900	929	947	959	974	983	988	991	994	995	996	997	997	998	999	999	999	000	
5500	7.00	0.00	0.00	.228	240	348	554	661	718	757	817	858	906	933	951	963	977	985	990	992	994	996	997	997	998	999	999	999	999	000	
5500	8.00	0.00	0.00	.219	261	375	563	666	722	760	824	864	911	938	954	965	979	986	990	993	995	996	997	997	998	999	999	999	999	000	
5500	9.00	0.00	0.00	.213	284	402	574	667	723	763	827	866	913	940	956	967	980	987	991	993	995	996	997	998	998	999	999	999	999	000	
5770	4.44	0.00	0.00	.285	250	345	508	604	662	703	774	820	878	911	934	949	967	978	984	988	991	993	995	996	996	998	998	999	999	000	
6000	1.50	0.00	0.00	.450	125	171	338	465	539	586	663	715	788	839	876	903	938	958	971	979	984	988	990	992	994	996	997	998	998	999	000
6000	2.00	0.00	0.00	.461	137	184	350	477	549	596	670	719	788	837	872	898	933	954	967	976	982	986	989	991	993	995	996	997	998	999	000
6000	3.00	0.00	0.00	.459	158	201	365	490	562	607	679	727	793	839	873	898	932	952	966	975	981	985	988	990	992	994	996	997	998	999	000
6000	4.00	0.00	0.00	.446	189	222	383	507	576	620	691	738	802	846	878	902	934	953	966	975	980	985	988	990	992	994	996	997	998	999	000
6000	5.00	0.00	0.00	.430	186	237	401	522	589	632	700	747	811	854	884	906	937	955	967	976	981	985	988	990	992	994	996	997	998	999	000
6000	6.00	0.00	0.00	.412	198	254	419	534	598	640	709	756	820	861	891	912	941	958	969	977	982	986	989	991	993	995	996	997	998	999	000
6000	7.00	0.00	0.00	.391	206	272	437	544	605	647	717	765	829	870	898	918	945	961	972	979	984	987	990	992	993	995	997	998	999	000	
6000	8.00	0.00	0.00	.371	218	293	451	552	612	653	725	774	838	878	906	925	950	965	974	981	985	988	991	992	994	996	997	998	999	999	000
6000	9.00	0.00	0.00	.355	234	314	462	556	615	657	731	781	845	884	911	929	953	967	976	982	986	989	992	993	994	996	997	998	999	999	000
6500	1.00	0.00	0.00	.627	129	156	288	384	448	491	566	620	701	763	811	847	897	929	949	962	971	978	982	986	989	992	994	996	997	998	999
6500	2.00	0.00	0.00	.652	169	176	300	396	458	500	572	623	699	752	800	838	888	920	942	956	967	974	980	983	986	990	993	995	996	998	999
6500	3.00	0.00	0.00	.671	139	189	313	408	471	512	582	632	704	758	800	834	883	914	935	951	962	970	976	980	984	989	992	994	995	997	999
6500	4.00	0.00	0.00	.671	189	209	327	422	481	522	591	640	710	762	802	835	881	912	933	949	960	968	974	979	982	988	991	993	995	997	999
6500	5.00	0.00	0.00	.662	187	223	343	435	493	533	602	651	720	770	809	840	884	913	934	948	959	967	973	978	982	987	990	993	994	997	999
6500	6.00	0.00	0.00	.636	190	237	359	448	504	544	614	663	732	782	820	850	891	919	937	951	961	969	974	979	982	987	991	993	995	997	999
6500	7.00	0.00	0.00	.602	197	253	373	458	513	553	624	674	745	795	832	860	899	925	943	955	964	971	976	980	984	988	991	993	995	997	999
6500	8.00	0.00	0.00	.573	208	269	385	466	520	560	631	683	756	806	842	869	906	930	947	959	967	973	978	982	985	989	992	994	995	997	999
7000	1.00	0.00	0.00	.788	115	140	251	327	379	418	489	543	629	697	752	796	859	900	927	945	958	967	974	979	983	988	991	994	995	997	999
7000	2.00	0.00	0.00	.826	117	155	261	335	386	422	490	541	622	686	739	783	848	890	918	938	952	962	970	975	980	986	990	992	994	997	999
7000	3.00	0.00	0.00	.879	125	177	272	344	394	429	493	542	619	679	728	769	832	876	906	927	943	955	963	970	975	982	987	990	993	996	999
7000	4.00	0.00	0.00	.912	134	188	285	356	404	438	501	549	622	679	725	764	825	868	898	920	936	948	958	965	971	979	985	988	991	995	998
7000	5.00	0.00	0.00	.936	144	202	299	368	414	448	511	558	629	682	726	763	821	862	892	913	930	942	952	961	967	976	982	987	990	994	998
7000	6.00	0.00	0.00	.933	157	216	313	380	425	459	521	568	638	691	733	769	823	863	891	912	928	941	951	958	965	975	981	986	989	994	998
7000	7.00	0.00	0.00	.918	153	228	326	390	435	469	531	578	647	700	742	776	829	866	893	914	929	942	951	959	965	974	981	985	988	994	998
7000	8.00	0.00	0.00	.884	166	246	338	400	445	479	541	588	658	711	753	787	838	873	899	918	932	944	953	960	966	975	981	986	989	994	998
7500	1.00	0.00	0.00	.760	110	136	237	305	355	392	462	518	610	685	747	798	871	914	941	958	968	976	981	985	988	991	994	995	996	998	999
7500	2.00	0.00	0.00	.965	112	144	237	300	343	376	437	487	569	634	688	734	807	859	896	922	940	954	963	970	976	983	988	991	993	996	998
7500	3.00	0.00	0.00	1.04	106	164	246	305	345	375	431	477	553	613	664	707	777	828	866	894	916	932	945	955	963	974	981	986	989	994	998
7500	4.00	0.00	0.00	1.144	130	168	257	315	352	381	435	478	549	607	657	700	770	822	860	888	910	926	939	949	957	969	977	983	987	993	998
7500	5.00	0.00	0.00	1.189	126	188	270	325	361	388	441	483	550	605	652	693	761	812	850	878	901	918	932	944	952	965	974	980	985	992	997
7500	6.00	0.00	0.00	1.232	138	195	283	336	370	397	449	490	555	607	651	690	755	804	841	870	893	911	925	936	946	960	970	977	982	990	997
7500	7.00	0.00	0.00	1.251	154	212	296	347	381	408	459	500	564	615	659	695	762	811	848	876	905	922	932	942	957	967	974	980	988	996	999
7500	8.00	0.00	0.00	1.244	169	226	308	357	391	418	469	510	574	624	666	702	761	806	840	867	888	905	919	930	942	955	966	973	979	988	996
8000	1.00	0.00	0.00	.537	125	156	259	329	382	423	502	570	654	788	853	895	942	964	976	983	988	990	993	994	995	996	997	998	999	000	
8000	2.00	0.00	0.00	.823	123	153	241	302	344	376	438	489	577	653	718	773	853														

TABLE 8B—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
8500	1.00	0.00	.310	167	197	316	400	472	534	663	758	871	925	952	968	983	990	993	995	996	997	998	998	998	999	999	999	999	000	000
8500	1.50	0.00	.611	144	175	266	328	373	408	478	539	651	744	813	862	920	950	967	976	983	987	990	992	993	995	996	997	998	999	999
8500	2.00	0.00	.890	134	181	256	310	346	374	427	472	554	626	691	746	830	884	919	941	956	966	973	979	983	988	991	993	995	997	999
8500	2.50	0.00	1.178	121	189	253	302	333	356	401	439	506	564	616	664	744	807	854	889	914	932	946	956	964	975	982	986	990	994	998
8500	3.00	0.00	1.449	109	201	254	298	326	347	387	421	479	529	574	614	685	743	792	831	862	887	907	923	936	954	966	975	981	989	996
8500	3.50	0.00	1.759	60	125	255	288	324	343	380	410	463	508	548	585	648	700	745	783	815	843	866	885	902	927	945	958	967	982	994
8500	4.00	0.00	2.025	91	174	262	301	326	344	378	406	455	497	533	567	624	672	713	749	779	806	830	850	868	897	920	937	950	971	990
8500	4.50	0.00	2.229	140	202	271	308	331	348	381	408	454	493	528	559	613	658	696	729	758	784	806	826	844	874	898	917	933	960	986
9000	1.50	0.00	.450	168	202	299	368	421	465	557	635	760	841	892	923	958	974	983	988	991	993	994	996	996	997	998	998	999	999	000
9000	2.00	0.00	.713	156	199	275	330	370	399	459	511	609	694	763	817	888	927	950	965	974	980	984	987	990	993	995	996	997	998	999
9000	2.50	0.00	.993	152	197	269	317	348	372	418	458	531	597	657	711	796	856	923	942	955	965	972	977	984	988	991	993	996	999	999
9000	3.00	0.00	1.299	157	197	267	310	337	358	397	430	489	542	590	635	713	777	827	865	893	915	932	944	954	968	977	982	987	993	997
9000	3.50	0.00	1.629	150	200	268	307	332	350	384	413	463	508	558	605	676	712	761	801	835	863	886	904	919	942	957	967	975	986	995
9000	4.00	0.00	1.971	130	198	270	307	330	346	377	403	447	487	523	556	615	666	710	749	782	811	837	858	877	907	929	945	957	976	992
9000	4.50	0.00	2.284	133	198	273	309	330	346	375	398	439	475	508	538	591	637	678	713	745	773	798	820	839	872	898	919	935	962	987
9400	3.90	0.00	1.787	152	210	277	313	336	352	383	408	454	494	532	567	630	685	732	773	809	838	863	884	901	927	946	959	968	982	994
9400	3.95	0.00	1.825	152	209	277	313	335	352	382	407	452	492	529	563	625	679	727	768	803	833	858	879	897	924	943	956	966	981	994
9400	4.00	0.00	1.862	152	210	277	313	335	351	381	406	450	489	526	560	621	674	721	762	797	827	852	874	892	920	940	954	964	980	994
9500	1.50	0.00	.354	188	224	335	415	480	535	642	722	831	893	929	950	973	983	989	992	994	995	996	997	998	998	999	999	999	999	000
9500	2.00	0.00	.581	175	218	301	359	403	437	507	569	679	764	826	869	923	951	967	977	983	987	990	992	993	995	996	997	998	999	999
9500	2.50	0.00	.835	170	210	287	336	369	395	445	490	573	648	713	767	846	895	927	947	960	969	976	981	984	989	992	994	995	997	999
9500	3.00	0.00	1.128	171	210	281	324	352	373	413	448	511	569	623	672	756	819	865	898	921	938	951	960	967	977	983	988	991	995	998
9500	3.50	0.00	1.462	170	212	280	318	342	360	394	423	474	521	565	605	678	740	791	832	865	890	910	926	938	956	968	976	982	990	997
9500	3.90	0.00	1.755	154	211	279	313	338	354	385	410	455	496	534	569	633	689	737	778	814	843	868	888	905	931	948	961	970	983	995
9500	4.00	0.00	1.832	159	214	279	315	337	353	383	408	451	491	528	562	623	677	725	766	801	831	857	886	923	942	956	966	981	988	994
9500	4.50	0.00	2.215	156	210	280	314	334	349	376	398	437	472	504	533	587	635	677	714	748	778	804	827	848	882	908	927	943	967	989
10000	1.50	0.00	.294	219	253	374	464	537	598	706	779	871	921	948	964	980	988	992	992	994	996	997	997	998	998	999	999	999	999	000
10000	2.00	0.00	.497	194	234	326	391	440	479	557	624	732	809	862	898	941	963	975	982	987	990	992	994	995	996	997	998	998	999	999
10000	2.50	0.00	.719	187	228	308	360	396	423	480	529	620	698	761	811	879	920	944	960	970	977	982	985	988	992	994	995	996	998	999
10000	3.00	0.00	.979	185	227	300	344	372	394	447	494	585	666	717	799	856	895	922	940	954	963	970	976	983	988	991	993	996	999	999
10000	3.50	0.00	1.288	183	227	295	333	358	376	411	441	495	545	592	636	715	778	827	865	893	915	931	944	953	967	976	982	986	992	997
10000	4.00	0.00	1.658	191	230	292	327	349	365	395	429	464	505	543	579	644	702	752	794	829	858	881	901	916	939	955	966	974	986	995
10000	4.50	0.00	2.070	176	224	290	323	343	357	384	406	444	478	511	541	596	645	689	729	764	795	822	846	866	898	922	940	953	974	991
10500	4.00	0.00	1.490	178	233	306	342	364	380	411	436	482	525	565	603	673	734	784	824	857	883	904	920	933	952	965	973	980	989	996
11000	2.00	0.00	.393	234	272	379	453	510	555	637	702	798	862	903	929	960	975	983	988	991	993	995	996	996	997	998	998	999	999	000
11000	2.50	0.00	.579	217	263	350	410	451	483	547	601	693	765	820	860	913	943	961	972	979	984	987	990	992	994	996	997	997	998	999
11000	3.00	0.00	.792	207	254	336	385	417	442	491	533	610	678	735	782	851	896	926	945	959	968	975	980	983	988	992	994	995	997	999
11000	3.50	0.00	1.045	199	251	327	368	395	415	453	487	548	604	656	702	778	836	876	905	926	942	953	962	969	978	984	988	991	995	998
11000	4.00	0.00	1.351	195	248	320	358	381	397	429	455	503	548	591	632	703	763	811	849	878	901	919	933	944	960	971	978	983	991	997
11000	4.50	0.00	1.725	195	244	315	349	370	385	411	433	473	509	544	577	637	692	740	781	815	845	869	889	905	931	948	960	969	983	994
11500	4.00	0.00	1.241	212	263	336	375	399	416	448	476	526	573	617	658	730	787	832	867	893	914	930	942	952	966	975	981	986	992	997
12000	2.00	0.00	.326	274	310	424	506	565	611	693	754	840	893	927	948	971	982	988	991	994	995	996	997	997	998	998	999	999	999	000
12000	2.50	0.00	.493	253	299	391	456	501	535	600	654	740	806	853	888	932	956	970	978	984	988	990	992	994	995	997	997	998	999	999
12000	3.00	0.00	.678	241	287	373	427	462	490	541	584	661	725	777	819	880	917	941	957	968	975	980	984	987	991	993	995	996	998	999
12000	3.50	0.00	.895	232	282	361	407	436	458	499	534	597	654	705	748	817	866	901	925	942	954	964	971	976	983	988	991	993	996	999
12000	4.00	0.00	1.154	208	267	351	382	417	435	468	486	548	596	640	681	751	806	848	880	904	923	937	949	957	970	978	983	987	993	998
12000	4.50	0.00	1.468	227	271	345	381	403	418	446	469	511	550	587	622	6														

TABLE 8B—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
13000	2.00	0.00	.276	310	346	460	545	606	652	735	794	872	918	945	961	979	987	991	994	995	996	997	998	998	999	999	999	999	999	000
13000	2.50	0.00	.432	286	330	425	493	538	574	639	697	774	834	877	907	946	976	984	987	990	992	994	995	996	997	998	998	999	999	000
13000	3.00	0.00	.600	274	318	406	462	500	528	580	623	697	758	806	845	898	931	951	964	973	979	984	987	989	993	995	996	997	998	999
13000	3.50	0.00	.794	265	311	392	442	473	495	537	572	635	691	739	779	842	886	916	937	952	962	970	976	980	986	990	992	994	997	999
13000	4.00	0.00	1.022	256	305	382	425	452	470	505	534	586	634	678	717	782	830	870	899	920	936	948	957	965	975	982	986	990	994	998
13000	4.50	0.00	1.266	257	299	373	412	435	451	480	504	547	588	625	660	722	774	816	850	877	899	916	930	941	958	969	976	982	990	997
14000	2.00	0.00	.233	344	379	491	577	640	689	774	831	901	938	960	972	985	991	994	996	997	998	998	999	999	999	999	999	999	999	000
14000	2.50	0.00	.384	316	356	451	520	567	603	669	721	801	857	896	922	954	971	980	986	990	992	994	995	996	997	998	998	999	999	000
14000	3.00	0.00	.540	303	343	431	490	528	557	609	652	725	783	828	864	912	941	959	970	978	983	986	989	991	994	995	996	997	998	999
14000	3.50	0.00	.718	295	337	417	469	501	524	567	602	665	718	764	802	861	900	927	945	958	968	974	979	983	988	991	993	995	997	999
14000	4.00	0.00	.927	288	331	406	453	480	499	534	564	616	663	706	743	805	851	886	911	930	944	955	963	970	979	984	988	991	995	998
14000	4.50	0.00	1.173	286	324	397	438	462	479	509	534	578	618	655	689	749	798	837	868	892	912	927	939	949	964	973	980	984	991	997
15000	2.00	0.00	.192	384	405	520	609	675	727	814	868	928	957	973	981	990	994	996	997	998	998	999	999	999	999	999	999	999	999	000
15000	2.50	0.00	.342	346	381	473	543	591	628	696	748	825	877	912	935	963	976	984	989	992	994	995	996	997	997	998	998	999	999	000
15000	3.00	0.00	.492	332	367	453	512	551	580	633	677	748	804	847	880	923	949	965	974	981	985	988	991	992	995	996	997	998	999	999
15000	3.50	0.00	.658	323	360	439	491	524	547	591	627	688	740	784	821	875	912	936	952	964	972	978	982	985	990	992	994	996	997	999
15000	4.00	0.00	.850	318	354	428	475	503	523	559	589	641	687	728	764	823	866	898	921	939	951	961	968	974	981	986	990	992	996	999
15000	4.50	0.00	1.077	314	348	418	460	485	502	533	559	603	643	680	713	770	816	853	882	904	922	936	947	955	968	977	982	986	993	997
16000	2.00	0.00	.150	432	454	553	646	716	773	862	910	956	975	984	989	994	997	998	998	999	999	999	999	999	999	999	999	999	999	000
16000	2.50	0.00	.305	382	410	493	564	613	652	721	773	847	896	927	947	970	981	987	991	993	995	996	997	997	998	998	999	999	999	000
16000	3.00	0.00	.450	364	392	471	531	570	600	655	698	768	822	863	893	933	956	970	978	984	987	990	992	993	995	997	997	998	999	999
16000	3.50	0.00	.607	354	384	457	510	543	568	612	648	708	752	788	821	873	908	938	968	975	980	984	987	991	993	995	996	998	999	999
16000	4.00	0.00	.787	347	378	446	493	522	543	580	610	661	707	747	782	838	879	908	930	945	957	972	977	984	988	991	993	996	999	999
16000	4.50	0.00	.999	343	372	436	479	504	522	555	580	624	664	700	732	787	831	866	893	914	930	943	952	960	972	979	984	988	993	998
17000	2.00	0.00	.126	480	503	601	703	784	843	924	956	980	989	993	996	998	999	999	999	999	999	999	999	999	999	999	999	999	999	000
17000	2.50	0.00	.268	415	438	513	583	635	675	748	798	870	914	941	958	976	985	990	993	995	996	997	997	998	998	999	999	999	999	000
17000	3.00	0.00	.411	398	420	489	548	588	618	674	718	787	839	878	906	942	962	974	981	986	989	992	993	994	996	997	998	998	999	999
17000	3.50	0.00	.562	387	410	474	527	560	585	630	666	726	776	817	851	899	930	950	963	972	978	983	986	989	992	994	996	997	998	999
17000	4.00	0.00	.733	379	403	463	510	540	560	598	628	679	724	763	797	851	890	917	937	951	961	969	975	979	985	989	992	994	997	999
17000	4.50	0.00	.932	373	397	454	496	522	540	572	598	642	681	717	748	802	844	877	902	922	937	948	957	964	975	981	986	989	994	998
18000	2.50	0.00	.233	440	461	532	604	658	701	776	827	893	931	954	968	982	989	993	995	996	997	998	998	999	999	999	999	999	999	000
18000	3.00	0.00	.375	423	442	505	563	604	635	694	737	806	856	892	918	950	968	978	984	988	991	993	994	995	997	997	998	998	999	000
18000	3.50	0.00	.521	414	434	491	541	575	601	647	683	743	792	832	864	909	937	956	967	975	981	980	985	988	992	994	995	996	998	999
18000	4.00	0.00	.684	407	427	480	525	554	576	614	644	695	740	778	811	863	899	925	943	956	965	972	978	982	987	991	993	995	997	999
18000	4.50	0.00	.872	400	421	471	510	536	555	588	614	659	697	732	763	815	856	887	911	929	943	953	962	968	977	983	988	990	995	998
20000	2.50	0.00	.163	481	504	579	661	724	773	849	893	940	964	977	984	991	995	996	997	998	998	999	999	999	999	999	999	999	999	000
20000	3.00	0.00	.310	451	470	530	591	636	671	733	777	843	888	918	939	964	977	985	989	992	994	995	996	997	998	998	999	999	999	000
20000	3.50	0.00	.449	446	464	516	566	602	630	678	715	774	821	858	887	927	951	965	975	981	985	988	991	992	995	996	997	998	999	999
20000	4.00	0.00	.599	442	460	506	550	580	603	642	673	724	768	805	836	884	916	939	954	965	972	978	982	985	990	992	994	996	998	999
20000	4.50	0.00	.770	438	456	498	536	563	582	616	642	687	726	760	790	839	876	904	925	941	953	962	969	974	982	987	990	992	996	999
22500	3.00	0.00	.233	488	509	569	637	689	728	793	834	890	925	947	962	978	986	991	993	995	996	997	997	998	998	999	999	999	999	000
22500	3.50	0.00	.368	470	488	539	593	634	665	717	755	814	858	891	915	946	965	975	982	987	990	992	993	995	996	997	998	998	999	999
22500	4.00	0.00	.509	466	482	526	572	607	631	674	709	769	810	837	865	907	934	953	965	973	979	983	987	989	992	994	996	997	998	999
22500	4.50	0.00	.665	464	479	519	558	586	606	645	673	719	757	790	819	865	898	922	940	953	963	970	975	980	986	990	992	994	997	999
25000	3.00	0.00	.172	545	565	621	687	740	779	842	860	926	952	968	977	987	992	995	996	997	998	998	999	999	999	999	999	999	999	000
25000	3.50	0.00	.300	504	522	572	627	671	705	760	797	851	889	916	936	961	974	982	987	991	993	994	995	996	997	998	998	999	999	000
25000	4.00	0.00	.428	489	506	549	595	630	660	708	742	794	835	867	892	927	949													

TABLE 8B—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	3.0	3.6	4.0	5.0	7.0
30000	3.50	0.00	.189	595	610	651	700	740	772	828	865	911	940	958	969	983	989	993	995	996	997	998	998	999	999	999	999	999	000	000
30000	4.00	0.00	.314	558	572	609	650	683	710	760	794	845	881	907	927	934	969	978	984	988	991	993	994	995	997	997	998	998	999	000
30000	4.50	0.00	.435	543	557	591	625	654	677	720	751	799	835	864	887	921	944	959	969	976	981	985	988	990	993	995	996	997	998	999
30000	5.00	0.00	.573	532	546	577	607	631	651	689	717	761	795	824	848	886	913	933	948	959	967	974	978	982	987	991	993	995	997	999
35000	3.50	0.00	.082	722	737	783	833	868	893	929	972	983	989	992	996	997	998	999	999	999	999	999	999	999	999	999	999	999	999	000
35000	4.00	0.00	.184	643	658	696	737	770	795	840	871	911	931	954	966	980	987	991	994	995	996	997	998	999	999	999	999	999	999	000
35000	4.50	0.00	.304	614	627	659	692	718	739	778	807	850	882	907	925	931	967	977	983	987	990	992	994	995	996	997	998	998	999	000
35000	5.00	0.00	.425	605	617	645	672	694	711	744	770	809	840	866	887	918	940	956	966	974	980	984	987	989	992	994	996	997	998	999
40000	4.00	0.00	.119	719	732	767	808	839	861	897	919	947	964	974	981	989	993	995	997	998	998	998	999	999	999	999	999	999	999	000
40000	4.50	0.00	.187	693	706	737	771	799	820	855	877	909	934	947	954	983	988	992	994	995	996	997	997	998	999	999	999	999	999	000
40000	5.00	0.00	.270	678	689	717	746	769	788	819	841	874	898	916	931	953	967	976	982	987	990	992	993	995	996	997	998	998	999	000
45000	4.50	0.00	.150	729	740	768	800	827	847	879	900	928	947	960	970	981	988	992	994	996	997	997	998	998	999	999	999	999	999	000
45000	5.00	0.00	.207	722	732	757	784	807	824	854	874	902	922	938	950	966	977	983	988	991	993	994	995	996	997	998	999	999	999	000
50000	4.50	0.00	.128	751	760	786	817	844	864	895	915	940	957	968	976	985	991	994	995	997	997	998	998	999	999	999	999	999	999	000
50000	5.00	0.00	.179	742	751	774	800	822	840	870	889	916	934	948	958	972	981	987	990	993	994	996	996	997	998	999	999	999	999	000
5500	2.00	-1.00	.209	208	277	520	664	729	772	835	873	919	944	960	970	982	989	992	995	996	997	998	998	999	999	999	999	999	000	000
5500	2.50	-1.00	.191	220	296	540	675	743	783	847	885	929	953	967	976	986	991	994	996	997	998	998	999	999	999	999	999	999	000	000
5500	3.00	-1.00	.174	233	316	557	686	752	795	860	897	939	960	972	980	989	993	995	997	998	998	999	999	999	999	999	999	999	000	000
5500	3.50	-1.00	.161	246	339	570	699	763	806	876	916	956	976	983	990	994	996	997	998	998	999	999	999	999	999	999	999	999	000	000
5500	4.00	-1.00	.154	261	364	586	702	769	811	876	912	949	978	981	995	996	997	998	998	999	999	999	999	999	999	999	999	999	000	000
5500	4.50	-1.00	.165	277	392	592	668	733	779	854	898	943	965	976	983	991	994	996	997	998	999	999	999	999	999	999	999	999	999	000
6000	2.00	-1.00	.389	183	242	404	535	605	650	718	765	828	869	898	919	946	963	973	980	985	988	991	992	994	996	997	998	998	999	000
6000	2.50	-1.00	.364	197	259	423	550	618	661	731	778	840	880	907	927	952	967	976	982	986	989	992	993	994	996	997	998	998	999	000
6000	3.00	-1.00	.333	211	275	441	562	629	673	745	793	855	893	918	936	959	972	980	985	989	991	993	994	995	997	998	998	999	999	000
6000	3.50	-1.00	.304	225	290	457	574	638	684	759	808	869	906	929	945	965	976	983	988	991	993	994	995	996	997	998	999	999	999	000
6000	4.00	-1.00	.278	237	304	471	582	649	695	773	823	882	916	938	953	971	980	986	990	993	995	996	997	998	999	999	999	999	999	000
6000	4.50	-1.00	.271	252	320	482	581	641	687	769	821	884	920	942	956	973	982	988	991	993	995	996	997	997	998	999	999	999	999	000
6500	2.00	-1.00	.615	158	220	331	429	492	535	605	654	726	778	819	850	895	924	944	957	967	974	979	983	986	990	993	995	996	998	999
6500	2.50	-1.00	.604	172	237	348	445	508	549	618	667	737	787	826	855	897	925	943	957	966	973	978	982	985	990	992	994	996	998	999
6500	3.00	-1.00	.578	188	253	364	461	521	561	631	680	750	799	836	864	903	929	946	958	967	974	979	983	986	990	993	995	996	998	999
6500	3.50	-1.00	.544	204	268	381	474	532	573	643	693	763	813	849	875	912	935	951	962	970	976	981	984	987	991	993	995	996	998	999
6500	4.00	-1.00	.502	220	282	396	486	543	583	656	709	781	829	863	888	922	943	958	967	974	979	983	986	989	992	994	996	997	998	999
6500	4.50	-1.00	.470	235	295	408	493	549	590	664	717	791	839	872	897	929	949	962	971	978	982	986	988	990	993	995	996	997	999	000
7000	2.00	-1.00	.850	142	203	289	358	407	444	509	558	634	691	738	778	839	880	909	930	945	956	965	971	976	983	987	991	993	996	999
7000	2.50	-1.00	.857	152	218	305	372	421	456	520	568	641	697	743	781	838	877	906	926	941	953	961	968	973	981	986	989	992	996	999
7000	3.00	-1.00	.862	166	235	320	387	434	469	531	578	649	704	748	783	836	875	903	923	938	950	959	966	971	979	985	988	991	995	998
7000	3.50	-1.00	.845	183	245	336	400	446	481	544	591	662	715	757	792	843	879	904	924	938	949	958	965	971	979	984	988	991	995	998
7000	4.00	-1.00	.814	201	262	350	413	459	494	557	605	675	728	769	803	852	885	910	927	941	951	959	966	971	979	984	988	991	995	998
7000	4.50	-1.00	.774	218	279	362	424	470	505	569	616	688	741	782	814	860	893	916	933	945	955	962	969	973	981	985	989	991	995	998
7500	2.00	-1.00	1.060	134	188	263	317	356	386	443	489	563	624	675	719	788	838	874	901	921	937	949	958	965	975	982	986	989	994	998
7500	2.50	-1.00	1.091	141	208	276	328	365	393	447	491	562	619	669	712	781	831	868	895	916	931	944	954	961	972	980	985	988	993	998
7500	3.00	-1.00	1.130	152	211	291	341	376	403	456	498	566	621	667	708	773	823	859	887	908	924	937	947	956	968	976	982	986	992	997
7500	3.50	-1.00	1.160	167	228	307	354	387	414	466	508	574	626	670	708	771	816	853	880	901	918	931	942	950	963	973	979	984	991	997
7500	4.00	-1.00	1.159	185	247	322	367	400	426	479	520	585	636	679	716	776	820	854	880	900	916	929	939	948	961	970	977	982	990	997
7500	4.50	-1.00	1.141	206	262	335	379	412	438	491	532	596	646	688	724	781	824	855	881	900	916	929	939	948	961	970	977	982	990	997

TABLE 8B—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0				
8000	2.00	-1.00	1.085	142	189	255	303	337	363	415	459	534	596	649	696	772	830	872	902	925	941	953	962	969	978	984	988	991	995	998				
8000	2.50	-1.00	1.350	157	192	262	306	337	360	406	445	512	568	616	658	728	783	826	860	887	908	924	937	948	963	973	980	984	991	997				
8000	3.00	-1.00	1.392	149	201	275	316	343	365	409	446	508	560	606	647	716	770	813	847	873	894	911	925	936	953	965	973	979	988	996				
8000	3.50	-1.00	1.442	181	221	287	325	351	372	414	449	509	558	601	640	707	761	804	837	864	886	903	918	929	942	956	961	970	977	987	996			
8000	4.00	-1.00	1.481	175	231	301	337	363	382	423	457	514	562	604	642	705	757	798	832	858	880	897	912	924	942	956	966	973	985	995				
8000	4.50	-1.00	1.499	192	252	316	351	375	394	434	468	524	571	612	648	709	758	798	830	855	876	893	908	920	938	952	962	970	983	994				
8500	2.00	-1.00	.928	138	190	264	310	344	371	423	468	547	617	679	733	817	873	910	934	951	962	970	976	980	986	990	993	994	997	999				
8500	2.50	-1.00	1.216	126	185	263	304	333	355	399	437	503	561	613	658	736	788	848	889	918	938	952	962	974	982	987	990	993	996	998				
8500	3.00	-1.00	1.499	124	191	268	305	329	349	388	421	479	529	574	615	684	740	787	825	856	882	902	918	931	951	964	972	979	988	996				
8500	3.50	-1.00	1.767	118	153	272	310	333	350	365	415	467	513	553	589	651	703	746	783	814	840	863	882	898	924	942	955	965	981	994				
8500	4.00	-1.00	1.986	152	215	288	320	341	357	390	417	465	507	544	578	634	682	722	756	786	811	834	853	870	898	920	936	949	971	990				
8500	4.50	-1.00	2.135	161	221	300	333	353	369	399	426	472	512	542	576	641	675	712	744	771	797	819	838	852	880	903	921	935	961	986				
9000	2.00	-1.00	.732	176	220	289	335	371	400	457	508	602	685	753	807	880	922	946	962	972	978	983	986	989	992	994	996	997	998	999				
9000	2.50	-1.00	1.018	167	216	281	321	349	372	417	457	529	594	652	704	788	848	889	918	938	952	962	969	975	982	987	990	993	996	998				
9000	3.00	-1.00	1.341	162	212	278	310	331	348	381	409	459	504	545	583	649	705	752	793	826	854	878	897	912	936	953	965	974	980	994	998			
9000	3.50	-1.00	1.683	157	206	279	310	331	348	381	409	459	504	545	583	649	705	752	793	826	854	878	897	912	936	953	965	974	980	994	998			
9000	4.00	-1.00	2.012	158	199	283	313	332	347	376	401	446	486	522	555	614	664	708	745	778	806	831	853	871	902	924	941	953	974	991				
9000	4.50	-1.00	2.290	171	219	292	320	338	352	376	401	442	479	512	542	596	641	681	716	746	773	797	819	838	870	896	916	932	960	986				
9500	2.00	-1.00	.592	204	247	320	368	408	440	507	566	671	755	818	863	918	948	965	975	981	986	989	991	993	995	996	997	998	999	999				
9500	2.50	-1.00	.851	193	238	304	344	373	398	446	479	549	617	693	755	805	874	916	941	958	968	976	981	985	987	991	994	995	996	998	999			
9500	3.00	-1.00	1.157	189	232	296	330	354	374	413	447	509	566	612	712	793	851	891	918	937	951	961	969	974	982	987	990	993	996	998	999			
9500	3.50	-1.00	1.499	184	226	293	323	343	360	393	421	472	518	561	601	672	733	783	824	857	883	904	921	934	953	965	974	980	993	996	999			
9500	4.00	-1.00	1.880	183	219	292	320	338	352	381	404	448	487	524	558	620	673	719	760	794	824	850	871	889	918	938	952	963	980	993	998			
9500	4.50	-1.00	2.246	190	228	293	320	338	352	376	397	435	470	502	533	587	631	673	716	746	775	804	824	844	877	904	924	939	965	986	998			
10000	2.00	-1.00	.506	231	268	349	401	445	481	555	618	724	801	855	893	937	960	973	981	986	989	992	993	994	996	997	998	998	999	999				
10000	2.50	-1.00	.779	223	262	329	372	403	428	482	529	617	693	755	805	874	916	941	958	968	976	981	985	987	991	994	995	996	998	999	999			
10000	3.00	-1.00	.991	224	260	320	354	379	399	440	476	544	606	662	712	793	851	891	918	937	951	961	969	974	982	987	990	993	996	998	999			
10000	3.50	-1.00	1.314	216	255	312	342	363	379	413	442	494	543	589	632	708	771	820	858	888	910	927	940	951	965	975	981	985	992	997	999			
10000	4.00	-1.00	1.688	227	260	308	334	353	367	395	419	463	503	541	576	641	697	746	788	823	852	876	896	912	936	952	964	972	985	995	999			
10000	4.50	-1.00	2.116	217	253	304	329	346	359	383	403	441	475	507	537	592	641	685	724	758	789	816	839	860	893	917	936	950	972	992	999			
5500	2.00	-2.00	.190	226	286	534	681	745	788	850	887	930	953	967	976	986	991	994	996	997	998	998	999	999	999	999	999	999	999	999	999			
5500	2.50	-2.00	.169	238	301	553	693	763	803	866	903	942	963	974	981	989	993	996	997	998	998	999	999	999	999	999	999	999	999	999	999	999		
5500	3.00	-2.00	.151	248	318	571	708	776	818	882	916	953	970	980	986	992	995	997	998	998	999	999	999	999	999	999	999	999	999	999	999	999		
5500	3.50	-2.00	.139	259	337	587	722	788	832	893	926	959	975	983	988	994	996	997	998	999	999	999	999	999	999	999	999	999	999	999	999	999	999	
5500	4.00	-2.00	.132	270	360	607	731	796	837	898	931	963	977	985	990	994	996	998	998	999	999	999	999	999	999	999	999	999	999	999	999	999	999	
5500	4.50	-2.00	.147	283	389	570	673	747	800	876	918	957	975	983	989	994	996	998	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	
6000	2.00	-2.00	.365	203	259	414	550	620	663	731	777	839	878	906	925	951	966	976	982	987	990	992	993	995	996	997	998	998	999	999	999	999	999	
6000	2.50	-2.00	.337	219	277	433	565	633	676	745	792	852	890	916	934	957	971	979	985	988	991	993	994	995	996	997	998	998	999	999	999	999	999	
6000	3.00	-2.00	.310	232	291	453	577	645	687	757	804	865	901	925	942	963	975	983	987	990	993	994	995	996	997	998	999	999	999	999	999	999	999	
6000	3.50	-2.00	.275	248	302	466	589	655	701	777	825	884	918	939	954	971	981	987	990	993	994	996	996	997	998	999	999	999	999	999	999	999	999	
6000	4.00	-2.00	.250	260	314	481	598	666	714	793	841	898	929	948	961	976	984	989	992	994	996	996	997	998	999	999	999	999	999	999	999	999	999	
6000	4.50	-2.00	.245	273	328	489	590	655	703	786	838	899	932	951	964	979	986	990	993	995	996	997	998	999	999	999	999	999	999	999	999	999	999	999
6500	2.00	-2.00	.592	186	248	339	439	503	546	616	666	736	787	826	857	900	928	946	959	969	975	980	984	987	991	993	995	996	998	999	999	999	999	
6500	2.50	-2.00	.575	203	263	356	456	519	560	630	679	748	797	834	863	904	930	947	959	968	975	980	983	986	990	993	995	996	998	999	999	999	999	
6500	3.00	-2.00	.544	221	274	374	472	533	574	644	693	763	811	847	873	911	935	952	963	971	977	981	984	987	991	993	995	996	998					

TABLE 8B—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0	
7000	2.00	-2.00	.840	174	229	299	363	413	449	515	565	639	697	743	781	840	881	910	930	945	956	964	971	976	983	987	991	993	996	999
7000	2.50	-2.00	.829	189	242	316	379	429	465	529	578	651	706	753	788	844	883	910	930	944	955	963	970	975	982	987	990	992	995	998
7000	3.00	-2.00	.827	207	263	331	394	443	478	542	589	660	714	757	793	846	882	908	927	942	953	961	968	973	981	986	989	992	995	998
7000	3.50	-2.00	.808	227	278	346	409	456	492	555	602	672	725	767	801	851	885	910	928	941	952	961	967	973	980	985	989	991	995	998
7000	4.00	-2.00	.767	248	297	360	423	470	505	569	617	688	741	782	815	862	894	917	934	946	956	963	969	974	981	986	989	992	995	998
7000	4.50	-2.00	.725	266	308	372	434	480	516	581	629	701	754	794	826	871	902	923	939	951	959	966	972	976	983	987	990	992	996	999
7500	2.00	-2.00	1.036	170	211	274	322	360	390	447	494	569	630	681	725	794	843	879	905	924	939	951	959	966	976	982	987	990	994	998
7500	2.50	-2.00	1.069	182	227	288	333	369	397	452	496	567	628	674	717	786	835	871	898	918	933	945	955	962	973	980	985	989	993	998
7500	3.00	-2.00	1.103	198	246	305	347	381	408	462	505	574	628	675	717	779	828	863	890	911	927	939	949	957	969	977	982	986	993	998
7500	3.50	-2.00	1.125	217	269	321	361	394	421	474	517	585	634	679	717	779	825	859	886	905	921	934	944	953	965	974	980	984	991	997
7500	4.00	-2.00	1.113	239	284	337	375	407	434	487	529	594	646	689	726	785	826	851	886	905	920	933	942	951	964	972	979	983	991	997
7500	4.50	-2.00	1.090	262	305	350	387	419	445	499	542	606	657	699	735	791	832	863	888	906	921	933	943	951	964	972	979	983	991	997
8000	2.00	-2.00	1.098	172	205	262	303	336	363	415	458	532	594	647	694	769	826	868	899	922	939	951	960	967	977	983	988	990	995	998
8000	2.50	-2.00	1.298	184	218	271	308	337	360	407	446	513	569	617	660	730	784	827	860	887	908	924	937	947	962	972	979	984	991	997
8000	3.00	-2.00	1.368	195	233	285	319	345	367	411	448	511	564	609	651	720	775	818	851	877	897	914	927	938	955	966	974	980	989	996
8000	3.50	-2.00	1.418	219	254	301	331	355	375	417	453	513	563	606	645	711	765	808	841	867	888	906	920	931	949	962	971	978	987	996
8000	4.00	-2.00	1.441	229	273	318	345	367	387	427	462	520	569	611	649	714	765	806	838	864	884	901	915	927	945	958	967	974	985	995
8000	4.50	-2.00	1.456	249	291	334	359	380	399	439	473	531	579	620	656	717	766	806	836	860	881	901	915	923	941	954	964	971	984	994
8500	2.00	-2.00	.939	190	222	273	311	344	370	422	467	547	616	677	730	813	869	907	932	949	960	969	975	979	986	990	992	994	997	999
8500	2.50	-2.00	1.226	192	224	272	305	332	354	398	436	503	561	612	657	734	795	842	877	903	923	938	950	959	971	979	984	988	993	998
8500	3.00	-2.00	1.508	197	230	278	307	330	348	387	420	479	530	575	615	684	739	786	823	854	879	899	916	929	949	962	972	978	988	996
8500	3.50	-2.00	1.747	204	240	288	313	333	350	385	415	468	514	555	591	653	704	747	783	814	840	862	881	897	922	941	954	964	980	993
8500	4.00	-2.00	1.974	217	256	301	324	343	358	390	418	468	511	548	582	639	685	725	759	788	813	835	854	871	898	920	936	949	970	990
8500	4.50	-2.00	2.100	234	269	319	340	356	371	402	429	477	518	554	585	638	682	718	749	776	800	821	839	855	882	904	922	936	961	986
9000	2.00	-2.00	.742	226	253	300	339	373	401	457	507	599	679	747	801	875	918	944	960	970	977	982	986	988	992	994	995	996	998	999
9000	2.50	-2.00	1.037	223	249	290	323	349	371	416	455	526	589	646	697	781	842	884	914	934	949	960	968	973	982	987	990	992	996	998
9000	3.00	-2.00	1.359	222	249	287	315	337	355	392	425	484	536	583	626	701	763	813	851	881	905	923	937	947	963	973	980	984	991	997
9000	3.50	-2.00	1.695	223	252	290	313	332	347	380	408	459	504	545	583	648	704	751	790	824	852	875	894	910	934	951	963	971	984	995
9000	4.00	-2.00	2.019	226	260	296	316	333	347	375	400	445	486	522	556	615	665	708	745	777	805	830	851	870	900	922	939	952	973	991
9500	4.50	-2.00	2.285	233	268	306	325	340	353	378	401	443	480	514	544	598	643	683	717	748	774	797	820	840	874	900	921	937	963	988
9500	2.00	-2.00	.603	257	281	330	369	406	438	502	560	664	748	811	857	914	945	963	974	981	985	988	991	992	995	996	997	998	999	999
9500	2.50	-2.00	.864	253	277	315	346	374	397	444	487	565	637	699	753	833	886	919	941	956	966	973	978	982	988	991	993	995	997	999
9500	3.00	-2.00	1.170	252	275	308	334	355	374	412	445	506	562	614	661	743	806	853	888	913	931	945	955	963	974	981	986	989	994	998
9500	3.50	-2.00	1.520	251	275	305	326	345	360	392	419	470	516	559	598	668	728	778	820	853	879	901	917	931	951	964	973	979	989	996
9500	4.00	-2.00	1.902	248	277	305	323	339	352	379	403	446	486	522	556	617	670	716	756	790	820	846	868	886	915	935	951	962	979	993
9500	4.50	-2.00	2.279	246	280	307	324	338	350	374	394	432	467	500	534	584	631	672	709	742	771	797	820	840	874	900	921	937	963	988
10000	2.00	-2.00	.515	283	305	356	399	440	475	547	610	716	794	850	888	934	959	972	980	985	989	991	993	994	996	997	998	999	999	999
10000	2.50	-2.00	.743	278	300	336	370	399	424	476	523	609	685	748	798	869	912	939	956	967	975	980	983	987	991	993	995	996	998	999
10000	3.00	-2.00	1.011	281	299	328	354	376	396	436	471	538	599	655	705	787	845	886	915	935	949	960	967	973	981	987	990	992	996	998
10000	3.50	-2.00	1.339	277	298	322	343	361	377	409	438	490	538	584	626	702	764	814	853	883	906	924	937	948	963	973	980	985	992	997
10000	4.00	-2.00	1.716	294	303	320	337	353	366	393	416	460	500	537	572	636	693	741	783	818	848	872	892	908	933	950	962	971	984	995
10000	4.50	-2.00	2.144	264	295	318	333	347	358	381	401	438	473	505	534	589	638	681	720	755	785	812	836	856	889	915	933	948	970	990

TABLE 8
C. Hγ

Table with 26 columns: TEFF, LOG G, LOG A, WIDTH, .00, .02, .04, .06, .08, .10, .15, .20, .30, .40, .50, .60, .80, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.8, 3.2, 3.6, 4.0, 5.0, 7.0. Rows represent spectral data for various stars, with values ranging from approximately 5500 to 8000 in the first column and 0.00 to 4.50 in the second column.

TABLE 8C—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
8500	1.00	0.00	.262	143	192	302	398	464	562	717	816	913	953	971	981	990	994	996	997	998	998	999	999	999	999	999	000	000	000
8500	1.50	0.00	.564	117	158	236	294	338	374	454	531	672	777	847	892	941	964	977	984	988	991	993	994	995	997	997	998	999	999
8500	2.00	0.00	.865	111	153	219	265	297	324	380	432	529	618	696	761	850	903	934	953	966	974	979	984	987	991	993	995	996	999
8500	2.50	0.00	1.179	107	155	213	251	278	300	347	398	462	530	592	649	746	817	867	902	926	942	955	964	970	979	985	989	991	999
8500	3.00	0.00	1.506	104	161	212	246	269	289	329	365	428	484	535	582	665	735	791	835	869	895	915	931	943	960	971	978	983	991
8500	3.50	0.00	1.837	62	142	214	245	266	284	321	352	409	458	503	543	615	676	728	773	810	841	867	888	905	931	949	961	970	984
8500	4.00	0.00	2.155	98	163	218	247	267	284	318	349	399	444	484	521	584	638	685	726	762	793	820	843	864	896	920	938	952	973
8500	4.50	0.00	2.411	130	177	225	253	273	288	321	349	398	440	478	512	570	625	663	703	736	762	788	811	832	866	893	914	931	960
9000	1.50	0.00	.407	141	187	273	342	400	449	560	657	794	873	918	944	970	982	988	992	994	995	996	997	997	998	999	999	999	000
9000	2.00	0.00	.680	129	171	240	289	325	355	422	466	607	709	786	841	908	943	962	973	980	985	988	991	992	994	996	997	997	999
9000	2.50	0.00	.976	126	168	229	267	295	318	367	413	498	579	652	716	812	873	912	936	953	964	972	977	981	987	991	993	994	999
9000	3.00	0.00	1.304	129	169	224	257	281	300	340	376	442	504	562	616	710	783	838	877	906	926	942	953	961	973	981	985	989	994
9000	3.50	0.00	1.666	130	172	223	253	274	290	324	355	410	461	509	552	631	699	756	803	841	871	894	913	928	949	963	972	978	988
9000	4.00	0.00	2.053	124	175	224	252	270	286	316	346	391	435	476	513	580	630	670	715	744	808	837	861	881	912	934	950	961	978
9000	4.50	0.00	2.421	129	178	227	253	271	285	313	338	382	421	457	490	550	602	648	689	725	757	786	811	833	870	898	920	937	964
9400	3.90	0.00	1.829	138	183	231	258	277	292	322	349	399	445	488	528	602	667	724	772	812	845	871	892	910	935	952	964	972	985
9400	3.95	0.00	1.871	138	183	231	258	276	291	321	348	397	442	484	524	596	661	716	764	805	838	865	887	905	931	949	964	971	984
9400	4.00	0.00	1.913	138	183	231	258	276	291	320	347	395	439	481	520	591	654	709	757	797	831	859	881	900	928	946	959	969	983
9500	1.50	0.00	.320	163	215	316	401	476	538	660	749	860	917	947	964	981	989	993	995	996	997	998	998	999	999	999	999	999	000
9500	2.00	0.00	.551	148	193	268	322	365	401	484	561	691	784	847	890	938	962	975	982	987	990	992	994	995	996	997	998	998	999
9500	2.50	0.00	.815	142	184	248	289	319	344	400	453	554	645	721	781	863	911	939	957	968	976	981	985	987	991	994	995	996	998
9500	3.00	0.00	1.120	143	182	239	272	296	316	359	398	471	541	607	679	764	832	879	911	933	948	959	967	973	981	986	990	992	995
9500	3.50	0.00	1.474	144	183	234	264	284	301	336	373	425	479	530	579	666	740	798	842	876	902	921	936	947	963	973	980	985	991
9500	3.90	0.00	1.792	140	185	232	260	279	294	324	351	401	448	491	532	607	673	731	779	819	851	877	898	914	939	955	966	974	986
9500	4.00	0.00	1.877	142	186	232	259	278	292	322	348	397	441	483	524	595	659	715	763	804	837	864	886	904	931	949	962	971	984
9500	4.50	0.00	2.307	145	187	233	258	275	288	315	338	380	418	454	487	549	602	652	700	736	770	802	827	850	886	913	933	948	971
10000	1.50	0.00	.266	194	248	361	460	543	609	726	805	895	939	962	974	987	992	995	996	997	998	998	999	999	999	999	999	999	000
10000	2.00	0.00	.472	168	215	297	358	408	451	543	622	746	828	881	915	953	971	981	986	990	992	994	995	996	997	998	998	999	999
10000	2.50	0.00	.702	160	203	271	315	348	377	441	501	611	702	773	826	894	932	954	967	976	981	985	988	990	993	995	996	997	998
10000	3.00	0.00	.971	158	199	258	293	318	339	386	429	512	590	660	720	810	869	907	933	949	961	969	975	980	986	990	992	994	996
10000	3.50	0.00	1.292	157	198	250	280	301	318	354	387	450	510	567	621	713	785	838	877	905	925	940	952	960	972	980	985	989	994
10000	4.00	0.00	1.682	161	199	245	271	290	305	335	361	411	458	502	545	624	693	752	799	838	868	892	911	926	947	961	971	978	988
10000	4.50	0.00	2.129	158	198	242	266	283	296	322	345	387	426	462	497	561	620	672	719	760	796	826	852	873	906	930	946	959	977
10500	4.00	0.00	1.504	162	210	260	287	306	321	352	379	432	482	531	578	662	732	789	833	867	893	914	929	941	959	970	977	983	990
11000	2.00	0.00	.374	210	261	357	430	488	535	630	705	811	877	916	941	968	980	987	991	993	995	996	997	997	998	998	999	999	000
11000	2.50	0.00	.569	193	241	318	370	410	444	517	582	689	771	830	872	924	952	967	977	983	987	990	992	993	995	996	997	998	999
11000	3.00	0.00	.790	184	231	297	337	367	392	446	487	589	669	734	787	861	906	934	953	965	973	979	983	986	990	993	995	996	999
11000	3.50	0.00	1.050	179	227	284	317	340	360	401	439	512	580	642	696	782	843	885	914	934	949	960	967	973	981	987	990	992	996
11000	4.00	0.00	1.366	177	224	275	303	323	339	371	400	457	511	562	611	696	765	817	857	887	910	928	941	951	966	975	981	986	992
11000	4.50	0.00	1.756	177	221	269	294	311	324	351	375	419	462	503	542	615	680	736	783	821	852	878	898	914	938	954	966	974	986
11500	4.00	0.00	1.258	192	239	292	322	342	358	392	423	482	539	592	641	724	789	838	874	901	922	937	949	958	970	978	984	988	993
12000	2.00	0.00	.310	252	305	408	488	548	597	689	759	853	907	938	957	977	986	991	993	995	996	997	997	998	998	999	999	999	000
12000	2.50	0.00	.486	229	279	364	421	464	500	574	637	738	811	862	898	940	962	975	982	987	990	992	994	995	996	997	998	998	999
12000	3.00	0.00	.680	218	266	338	383	416	443	500	552	643	718	772	824	887	925	948	963	972	979	983	986	989	992	994	996	996	999
12000	3.50	0.00	.905	211	259	321	358	384	405	450	490	566	630	693	744	812	873	908	932	948	960	968	974	979	985	989	992	994	996
12000	4.00	0.00	1.173	196	251	309	340	362	378	414	446	507	564	617	666	746	808	853	887	912	930	944	954	962	974	981	986	989	994
12000	4.50	0.00	1.499	207	249	300	327	345	359	388	413	462	508	553	595	670	734	785	827	860	886	906	922	935	954	966	974	980	989
12500	4.00	0.00	1.103	219	268	326	358	380	398	434	467	528	586	639	686	764	822	865	896	919	936	949	958	966	976	983	987	990	994

TABLE 8C—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
30000	3.50	0.00	.183	589	607	654	702	741	771	827	865	914	944	962	973	985	991	994	996	997	998	998	998	999	999	999	999	999	999	000
30000	4.00	0.00	.319	543	560	599	638	669	695	745	782	838	878	907	928	935	971	980	986	989	992	993	995	996	997	998	998	998	998	000
30000	4.50	0.00	.450	526	542	575	606	632	654	698	731	784	825	857	883	920	944	960	970	977	983	986	989	991	994	995	996	997	998	999
30000	5.00	0.00	.597	516	530	558	584	605	624	662	692	740	779	811	838	880	911	932	948	960	968	975	979	983	988	991	994	995	997	999
35000	3.50	0.00	.075	739	760	808	851	881	901	934	953	974	985	990	993	996	998	998	999	999	999	999	999	999	999	999	999	999	999	000
35000	4.00	0.00	.181	647	664	703	739	769	792	837	869	912	939	956	968	981	988	992	994	996	997	997	998	998	999	999	999	999	999	000
35000	4.50	0.00	.307	610	624	654	682	705	725	764	795	843	879	905	926	953	969	978	984	988	991	993	994	995	997	998	998	998	998	000
35000	5.00	0.00	.438	599	611	635	657	675	691	724	751	795	829	858	881	916	940	956	967	975	981	985	988	990	993	995	996	997	998	999
40000	4.00	0.00	.116	732	748	784	818	843	862	895	917	947	964	975	982	990	994	996	997	998	998	998	999	999	999	999	999	999	999	000
40000	4.50	0.00	.190	702	716	746	774	797	814	846	870	904	929	946	959	975	984	989	992	994	995	996	997	998	998	999	999	999	999	000
40000	5.00	0.00	.277	686	697	721	744	763	778	807	830	864	891	912	929	952	967	977	983	987	990	992	994	995	996	997	998	998	998	000
45000	4.50	0.00	.151	741	753	780	807	827	844	873	894	925	945	959	969	982	988	992	994	996	997	997	998	998	999	999	999	999	999	000
45000	5.00	0.00	.214	734	744	765	787	804	818	845	865	894	917	934	947	965	976	983	988	991	993	995	996	996	997	998	998	998	998	000
50000	4.50	0.00	.128	765	776	801	827	848	864	891	911	938	955	967	976	986	991	994	995	997	997	998	998	999	999	999	999	999	999	000
50000	5.00	0.00	.184	756	765	785	806	823	837	863	882	909	929	944	956	971	981	987	990	993	994	996	996	997	998	998	998	998	998	000
5500	2.00	-1.00	.205	179	285	548	663	722	764	829	871	919	946	962	973	984	990	993	995	997	997	998	998	999	999	999	999	999	999	000
5500	2.50	-1.00	.183	191	307	562	677	738	779	846	886	932	956	969	978	988	992	995	997	998	998	999	999	999	999	999	999	999	999	000
5500	3.00	-1.00	.163	204	331	581	692	756	798	864	902	943	964	974	983	991	994	996	997	998	999	999	999	999	999	999	999	999	999	000
5500	3.50	-1.00	.146	219	358	598	713	773	815	879	915	952	971	981	986	993	996	997	998	999	999	999	999	999	999	999	999	999	999	000
5500	4.00	-1.00	.135	237	390	613	723	786	827	889	927	958	974	986	994	996	998	999	999	999	999	999	999	999	999	999	999	999	999	000
5500	4.50	-1.00	.142	259	418	585	685	754	801	874	916	956	974	983	989	994	997	998	999	999	999	999	999	999	999	999	999	999	999	000
6000	2.00	-1.00	.390	159	226	412	524	584	626	697	749	819	865	897	920	949	966	976	982	987	990	992	993	995	996	997	998	999	999	000
6000	2.50	-1.00	.365	172	242	430	537	597	639	713	764	834	877	907	927	934	969	978	984	988	991	993	994	995	997	998	998	998	998	000
6000	3.00	-1.00	.330	184	259	446	550	612	656	732	784	852	893	920	938	961	974	982	987	990	993	994	995	996	997	998	998	998	998	000
6000	3.50	-1.00	.295	197	278	462	566	628	675	754	806	871	908	932	948	968	979	986	990	992	994	995	996	997	998	998	998	998	998	000
6000	4.00	-1.00	.264	210	297	478	582	649	696	776	827	887	922	943	958	975	984	989	992	994	996	997	997	998	998	998	998	998	998	000
6000	4.50	-1.00	.252	224	321	486	580	642	691	776	830	893	928	949	962	978	986	991	993	995	996	997	998	998	999	999	999	999	999	000
6500	2.00	-1.00	.619	138	197	317	407	463	503	574	627	708	769	815	850	898	928	948	961	970	977	981	985	988	991	994	995	996	998	999
6500	2.50	-1.00	.611	152	212	332	421	476	515	587	640	719	777	820	853	899	927	946	959	969	976	981	984	987	991	993	995	996	998	999
6500	3.00	-1.00	.585	166	228	350	436	491	531	603	657	735	791	831	862	905	931	949	961	970	976	981	984	987	991	994	995	996	998	999
6500	3.50	-1.00	.543	181	244	366	450	505	545	620	676	755	808	847	875	914	939	955	966	973	979	983	986	989	992	994	996	997	998	999
6500	4.00	-1.00	.496	196	259	380	464	519	561	639	697	776	827	864	890	925	947	961	971	977	982	986	988	990	993	995	996	997	998	999
6500	4.50	-1.00	.457	210	275	394	476	531	574	655	712	792	842	877	901	934	954	967	975	981	985	988	990	992	995	996	997	998	999	000
7000	2.00	-1.00	.858	122	175	260	325	370	405	472	525	608	675	730	776	842	885	914	934	949	960	968	974	978	985	989	992	994	996	999
7000	2.50	-1.00	.864	135	191	274	338	383	418	484	535	617	682	735	778	840	882	910	931	945	956	965	971	976	983	988	991	993	996	999
7000	3.00	-1.00	.867	149	208	289	352	396	430	495	546	626	689	739	779	838	879	907	927	943	954	962	969	974	982	986	990	992	996	999
7000	3.50	-1.00	.852	164	223	304	365	409	444	510	561	640	701	749	787	843	881	908	927	942	953	961	968	974	981	986	989	992	996	999
7000	4.00	-1.00	.817	181	239	318	379	424	460	526	578	657	717	764	800	852	887	913	931	944	955	963	969	974	981	986	990	992	996	999
7000	4.50	-1.00	.768	197	254	332	393	439	475	543	594	674	733	778	813	863	897	920	937	950	959	966	972	977	983	987	991	993	996	999
7500	2.00	-1.00	1.115	111	156	223	271	307	336	394	442	524	592	651	700	776	830	869	899	920	937	949	958	966	976	982	987	990	994	998
7500	2.50	-1.00	1.111	123	175	239	285	320	348	404	452	530	597	655	704	780	833	871	899	919	935	947	956	964	974	981	986	989	994	998
7500	3.00	-1.00	1.136	137	189	254	298	332	359	415	461	536	599	654	701	774	827	864	892	913	929	942	952	960	971	979	984	988	993	998
7500	3.50	-1.00	1.165	152	205	268	310	343	371	426	471	544	604	650	700	770	821	857	885	906	923	936	946	955	967	975	981	986	992	998
7500	4.00	-1.00	1.165	169	222	282	323	356	384	439	484	556	615	665	708	774	822	857	883	904	920	933	944	952	965	974	980	984	991	997
7500	4.50	-1.00	1.144	187	238	295	337	370	398	454	499	569	627	675	716	779	825	859	885	905	921	933	943	952	964	973	979	984	991	997

TABLE 8C—Continued

Table with columns: LOG A, LOG B, LOG C, LOG D, LOG E, LOG F, LOG G, LOG H, LOG I, LOG J, LOG K, LOG L, LOG M, LOG N, LOG O, LOG P, LOG Q, LOG R, LOG S, LOG T, LOG U, LOG V, LOG W, LOG X, LOG Y, LOG Z. Rows contain numerical data for various stellar parameters.

TABLE 8C—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
7000	2.00	-2.00	.853	1.47	193	264	329	375	410	477	530	613	678	732	777	842	884	914	934	948	959	967	973	978	985	989	992	994	996	999
7000	2.50	-2.00	.835	1.64	210	281	345	391	427	493	546	627	691	743	785	846	887	914	934	949	959	967	973	978	984	988	991	993	996	999
7000	3.00	-2.00	.836	1.81	227	296	359	405	440	506	557	637	699	749	788	845	884	911	931	945	956	964	971	976	983	987	990	993	996	999
7000	3.50	-2.00	.816	1.99	242	312	374	420	455	522	573	652	712	759	797	851	888	914	932	946	956	964	970	975	982	987	990	992	996	999
7000	4.00	-2.00	.771	2.17	257	326	389	435	471	539	591	672	731	776	812	863	896	919	937	950	959	967	972	977	983	988	991	993	996	999
7000	4.50	-2.00	.719	2.33	270	340	403	450	487	556	609	690	749	792	826	874	906	928	944	955	963	970	975	979	985	989	992	994	997	999
7500	2.00	-2.00	1.088	1.37	174	229	276	312	341	400	449	532	601	660	709	784	837	874	902	923	939	951	960	967	976	983	987	990	994	998
7500	2.50	-2.00	1.085	1.54	193	245	290	324	353	410	458	537	606	662	711	786	838	875	903	922	938	949	958	966	975	982	986	989	994	998
7500	3.00	-2.00	1.108	1.71	212	261	303	337	364	421	468	544	608	662	708	781	832	868	895	916	932	944	953	961	972	979	985	988	994	998
7500	3.50	-2.00	1.134	1.89	230	276	316	349	377	433	478	552	613	665	709	777	827	863	889	910	926	936	944	952	968	977	986	992	997	999
7500	4.00	-2.00	1.123	2.09	247	290	330	363	391	448	493	567	626	677	719	783	830	863	889	909	924	936	946	955	967	975	981	985	992	997
7500	4.50	-2.00	1.095	2.29	264	304	343	377	406	464	509	581	639	688	728	790	834	868	892	911	926	938	947	955	967	975	981	985	992	997
8000	2.00	-2.00	1.116	1.35	167	213	252	283	309	363	409	491	561	622	676	765	831	877	908	931	946	958	966	972	981	986	989	992	995	998
8000	2.50	-2.00	1.359	1.46	178	219	253	280	303	351	393	466	528	582	630	710	772	820	858	887	910	927	940	951	965	975	981	985	992	997
8000	3.00	-2.00	1.431	1.61	195	235	266	292	313	360	400	469	528	582	630	709	768	813	847	874	895	913	927	938	955	966	975	980	989	996
8000	3.50	-2.00	1.432	1.82	215	252	280	304	325	370	410	476	533	584	630	707	766	811	845	872	894	911	925	936	954	965	974	980	989	996
8000	4.00	-2.00	1.444	1.98	235	269	295	318	339	383	421	487	543	593	637	711	767	810	843	869	890	907	921	933	950	962	971	977	987	996
8000	4.50	-2.00	1.459	2.18	253	284	309	331	352	396	435	500	554	601	644	713	767	808	840	865	886	902	916	928	945	958	967	974	986	995
8500	2.00	-2.00	.920	1.51	181	224	262	293	320	376	426	517	600	674	737	829	887	922	944	959	968	975	980	984	989	992	994	995	997	999
8500	2.50	-2.00	1.240	1.53	182	220	251	276	297	344	385	459	525	584	638	729	799	851	887	914	933	947	957	965	976	982	987	990	994	998
8500	3.00	-2.00	1.564	1.58	187	223	249	270	288	328	364	428	485	535	581	659	725	778	822	856	883	905	922	935	954	966	975	981	989	996
8500	3.50	-2.00	1.874	1.65	197	230	252	271	288	324	356	414	464	509	549	618	676	725	767	803	833	858	879	924	943	943	957	966	981	994
8500	4.00	-2.00	2.137	1.78	211	241	261	279	294	328	358	411	458	498	535	598	650	695	733	766	796	821	843	862	893	917	935	949	971	990
8500	4.50	-2.00	2.316	1.95	227	256	275	291	306	339	368	420	464	502	536	594	642	683	718	749	776	799	820	839	871	896	916	932	959	986
9000	2.00	-2.00	.713	1.82	209	251	292	325	354	418	478	590	688	766	824	896	934	956	969	977	983	986	989	991	994	995	996	997	998	999
9000	2.50	-2.00	1.026	1.78	202	237	268	294	316	364	408	490	566	635	697	793	858	900	927	946	958	967	974	979	985	989	992	994	996	999
9000	3.00	-2.00	1.374	1.78	200	232	257	278	296	335	371	437	496	552	603	692	764	820	862	893	915	932	945	955	969	977	983	987	993	997
9000	3.50	-2.00	1.749	1.80	203	232	253	271	286	320	350	406	457	503	546	621	686	741	787	825	856	881	901	917	941	956	967	975	986	995
9000	4.00	-2.00	2.125	1.84	211	236	254	270	283	313	340	389	434	475	512	578	635	684	727	765	797	825	849	870	902	926	943	956	975	992
9000	4.50	-2.00	2.454	1.94	221	245	262	276	288	315	339	385	425	462	496	555	606	651	690	724	755	782	807	828	864	892	914	932	960	987
9500	2.00	-2.00	.576	2.11	238	281	325	364	397	474	545	671	766	832	878	930	957	971	980	985	989	991	993	994	996	997	997	998	999	999
9500	2.50	-2.00	.849	2.05	227	261	293	320	344	397	447	542	629	704	765	850	901	932	951	964	973	979	983	986	990	993	994	996	997	999
9500	3.00	-2.00	1.169	2.03	222	251	276	297	315	356	394	465	531	594	651	747	817	867	901	925	942	954	963	970	979	985	989	991	995	998
9500	3.50	-2.00	1.542	2.03	221	246	266	284	299	332	363	419	472	522	569	653	724	782	827	863	890	911	927	940	958	969	977	982	990	997
9500	4.00	-2.00	1.962	2.03	224	244	261	276	289	317	343	391	436	477	516	586	647	702	749	789	822	850	874	893	922	942	956	966	981	994
9500	4.50	-2.00	2.395	2.06	227	246	261	274	286	310	333	375	414	450	483	544	596	645	688	725	759	789	815	838	875	903	925	941	967	989
10000	2.00	-2.00	.494	2.35	263	309	358	403	441	528	604	727	812	868	905	947	978	985	989	991	993	995	995	997	997	998	998	999	999	999
10000	2.50	-2.00	.730	2.28	249	284	318	348	374	434	491	596	686	757	812	884	925	949	964	973	980	984	987	989	993	994	996	997	998	999
10000	3.00	-2.00	1.007	2.28	243	271	297	319	339	383	424	503	578	646	702	787	858	899	926	944	957	966	973	978	985	989	992	993	996	998
10000	3.50	-2.00	1.348	2.25	240	262	283	301	317	351	383	443	501	555	607	697	769	824	865	895	917	934	946	956	969	977	983	987	993	997
10000	4.00	-2.00	1.748	2.33	242	258	276	291	304	332	357	406	452	496	537	613	680	738	786	825	856	882	902	918	941	957	968	975	986	995
10000	4.50	-2.00	2.217	2.22	240	255	270	284	295	318	340	381	420	456	490	553	610	661	707	747	782	813	839	861	896	922	940	953	974	993

TABLE 8
D. H δ

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0	
5500	0.00	0.00	0.00	.299	126	244	342	409	570	669	762	812	877	917	941	957	975	984	989	992	994	995	996	997	997	998	998	999	999	000	
5500	0.50	0.00	0.00	.309	130	219	289	437	597	671	753	802	867	908	934	951	971	981	988	991	994	995	996	997	997	998	999	999	999	000	
5500	1.00	0.00	0.00	.309	137	196	284	503	622	685	752	803	866	906	931	949	969	980	987	991	993	995	996	997	998	998	999	999	999	000	
5500	1.50	0.00	0.00	.299	149	196	393	565	641	685	755	803	866	906	932	949	969	980	986	990	993	995	996	997	998	998	999	999	999	000	
5500	2.00	0.00	0.00	.284	160	251	475	602	652	693	762	810	872	910	934	951	970	981	987	991	993	995	996	997	997	998	999	999	999	000	
5500	2.50	0.00	0.00	.267	178	302	506	604	662	702	772	820	881	916	939	955	973	983	988	992	994	996	997	997	998	999	999	999	999	000	
5500	3.00	0.00	0.00	.253	197	333	518	613	658	710	781	829	888	923	944	958	975	984	989	993	995	996	997	998	999	999	999	999	999	000	
5500	3.50	0.00	0.00	.237	222	362	529	620	678	720	794	841	897	930	950	963	978	986	991	994	995	996	997	998	999	999	999	999	999	000	
5500	4.00	0.00	0.00	.222	255	386	538	627	685	729	802	849	904	935	954	967	981	988	992	994	996	997	998	999	999	999	999	999	999	000	
5500	4.50	0.00	0.00	.212	294	410	544	631	691	735	809	855	910	939	957	969	982	989	993	995	996	997	998	999	999	999	999	999	999	000	
5770	4.44	0.00	0.00	.286	240	348	481	567	626	672	752	805	871	909	934	950	970	980	987	990	993	995	996	997	997	998	999	999	999	000	
6000	0.50	0.00	0.00	.457	98	164	212	305	453	537	632	692	780	841	882	909	945	965	976	983	987	990	992	994	995	997	998	998	999	000	
6000	1.00	0.00	0.00	.479	106	157	203	357	482	546	629	686	770	830	871	900	937	958	971	980	985	988	991	993	994	996	997	998	998	999	000
6000	1.50	0.00	0.00	.483	117	154	244	414	506	555	633	688	770	830	871	900	937	958	971	980	985	988	991	993	994	996	997	998	998	999	000
6000	2.00	0.00	0.00	.472	133	166	319	456	525	569	644	699	777	831	870	898	933	955	968	977	983	987	990	992	993	995	997	997	998	999	000
6000	2.50	0.00	0.00	.452	142	201	373	479	538	580	656	710	788	839	876	903	936	957	969	977	983	987	990	992	993	995	997	997	998	999	000
6000	3.00	0.00	0.00	.428	157	237	399	491	549	591	667	723	800	849	884	909	941	960	971	979	984	988	990	992	994	996	997	998	998	999	000
6000	3.50	0.00	0.00	.404	171	265	414	502	559	602	681	737	813	860	893	916	946	963	974	981	986	989	991	993	994	996	997	998	998	999	000
6000	4.00	0.00	0.00	.379	190	289	425	511	569	614	694	751	825	871	902	924	951	967	977	983	987	990	992	994	995	997	998	998	999	999	000
6000	4.50	0.00	0.00	.357	215	310	435	518	578	624	707	763	836	880	910	930	956	970	979	985	989	991	993	995	996	997	998	999	999	999	000
6500	1.00	0.00	0.00	.639	91	130	163	273	378	436	520	582	683	758	812	852	900	936	955	967	975	981	985	988	990	993	995	996	997	998	999
6500	1.50	0.00	0.00	.674	107	131	191	318	397	443	520	577	671	744	798	838	893	926	947	961	970	977	982	985	988	991	994	995	996	998	999
6500	2.00	0.00	0.00	.693	109	139	242	351	413	454	528	583	670	738	789	829	882	918	940	955	966	973	979	983	986	990	993	995	996	998	999
6500	2.50	0.00	0.00	.694	132	160	278	370	435	465	536	591	676	741	791	828	882	915	937	953	964	972	977	982	985	989	992	994	996	998	999
6500	3.00	0.00	0.00	.684	140	187	305	385	437	476	549	603	687	749	796	832	883	915	937	952	963	970	976	981	984	989	992	994	996	998	999
6500	3.50	0.00	0.00	.657	152	211	324	399	450	490	564	620	703	763	808	842	889	919	940	954	964	971	977	981	985	989	992	994	996	998	999
6500	4.00	0.00	0.00	.619	165	232	338	411	463	503	580	637	721	780	822	854	898	926	944	954	964	971	977	981	985	989	992	994	996	998	999
6500	4.50	0.00	0.00	.580	180	250	350	421	473	515	594	654	738	795	835	865	907	933	950	962	970	977	981	985	987	991	994	995	996	998	999
7000	1.00	0.00	0.00	.845	82	106	133	219	297	345	422	482	583	664	727	777	850	898	929	948	961	970	977	981	985	989	992	994	995	997	999
7000	1.50	0.00	0.00	.870	87	112	161	257	318	358	430	487	584	664	728	777	856	890	919	940	954	964	971	977	981	987	990	993	994	997	999
7000	2.00	0.00	0.00	.907	101	122	198	280	330	366	433	488	578	653	714	764	846	880	910	932	947	959	967	973	978	984	989	991	993	996	999
7000	2.50	0.00	0.00	.939	112	142	230	298	341	375	441	494	580	650	708	756	825	870	902	924	940	952	962	969	974	982	987	990	992	995	998
7000	3.00	0.00	0.00	.964	125	165	250	310	352	386	451	503	585	651	706	751	817	862	893	917	934	947	957	964	970	979	985	989	991	995	998
7000	3.50	0.00	0.00	.963	138	187	266	323	364	398	464	515	596	660	712	755	818	862	892	914	932	945	955	962	969	977	983	987	990	995	998
7000	4.00	0.00	0.00	.941	157	206	281	335	376	410	476	528	609	673	723	764	824	866	895	916	933	945	955	962	969	977	983	987	990	995	998
7000	4.50	0.00	0.00	.903	164	219	292	346	389	423	491	543	626	689	738	778	834	873	901	921	936	948	957	964	970	978	984	988	991	995	998
7500	1.00	0.00	0.00	.733	76	102	127	204	278	324	403	467	581	680	761	822	898	937	958	971	979	984	987	990	992	994	996	997	997	998	999
7500	1.50	0.00	0.00	1.006	78	97	140	214	283	297	361	415	505	582	651	710	803	866	906	932	950	962	970	976	980	986	990	992	994	996	999
7500	2.00	0.00	0.00	1.220	85	106	168	227	264	292	350	398	481	551	611	663	745	807	853	887	912	931	945	956	964	975	982	986	989	994	998
7500	2.50	0.00	0.00	1.238	97	127	196	246	279	306	363	410	492	562	623	675	754	810	851	881	905	923	937	947	956	969	977	983	987	993	997
7500	3.00	0.00	0.00	1.223	109	151	216	261	293	320	375	421	499	567	626	677	756	812	852	883	905	923	937	948	956	969	977	983	987	993	997
7500	3.50	0.00	0.00	1.260	122	171	231	272	304	330	385	430	505	569	625	674	750	804	844	874	898	916	930	942	951	964	973	980	985	992	997
7500	4.00	0.00	0.00	1.282	135	186	244	284	315	341	396	441	515	577	630	676	748	801	839	869	892	911	925	937	946	960	970	977	982	990	997
7500	4.50	0.00	0.00	1.274	151	200	255	295	325	353	409	454	528	588	640	684	758	803	840	869	891	909	923	935	955	969	976	981	990	997	999
8000	1.00	0.00	0.00	.463	96	123	157	247	325	380	466	587	753	852	906	937	968	981	988	991	994	995	996	997	997	998	999	999	999	999	000
8000	1.50	0.00	0.00	.789	87	107	159	227	271	305	372	432	545	647	733	799</															

TABLE 8D—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.6	4.0	5.0	7.0			
8500	1.00	0.00	.255	136	170	209	329	462	564	736	885	926	961	977	985	992	996	997	998	998	999	999	999	999	999	999	999	999	999	999	999	999	999		
8500	1.50	0.00	.553	108	130	186	259	312	352	439	525	680	790	859	903	948	980	986	990	992	994	995	996	997	998	998	999	999	999	999	999	999	999		
8500	2.00	0.00	.865	102	125	183	235	269	296	354	409	513	612	697	765	858	909	939	957	968	976	981	985	988	991	994	995	996	997	998	999	999	999		
8500	2.50	0.00	1.196	100	136	187	224	249	271	317	359	436	509	576	639	744	820	871	906	929	945	957	966	972	981	986	989	992	995	996	999	999	999		
8500	3.00	0.00	1.545	100	148	190	218	240	258	298	334	398	457	511	561	651	726	787	834	870	897	917	933	945	961	972	979	984	991	997	999	999	999		
8500	3.50	0.00	1.905	74	142	191	217	236	253	289	330	377	428	474	517	603	656	715	763	803	837	864	887	905	931	949	962	971	984	991	999	999	999		
8500	4.00	0.00	2.262	103	152	194	218	237	252	286	315	367	413	454	491	557	615	665	709	747	781	810	836	858	892	918	937	951	973	991	999	999	999		
8500	4.50	0.00	2.556	125	163	201	224	242	252	288	316	365	408	447	481	542	593	639	678	713	745	773	797	820	857	886	909	928	958	986	999	999	999		
9000	1.50	0.00	.399	132	157	221	309	379	436	559	664	806	884	926	950	974	985	990	993	995	996	997	997	998	998	999	999	999	999	999	999	999	999		
9000	2.00	0.00	.675	119	145	207	262	299	330	401	471	604	713	793	849	915	947	965	976	982	986	989	991	993	995	996	997	998	998	999	999	999	999		
9000	2.50	0.00	.982	117	147	202	240	267	289	340	387	479	567	647	716	817	879	916	940	956	966	974	979	983	988	991	993	995	997	999	999	999	999		
9000	3.00	0.00	1.325	119	151	199	229	251	269	309	346	416	481	544	602	704	783	840	881	909	929	944	955	963	975	982	986	989	994	998	999	999	999	999	
9000	3.50	0.00	1.710	121	158	200	223	243	259	293	323	381	434	483	530	614	688	750	801	841	872	896	915	929	950	964	973	979	989	996	999	999	999	999	
9000	4.00	0.00	2.128	122	162	200	223	240	254	284	311	360	405	447	486	557	619	675	723	766	803	838	879	912	934	950	962	979	993	999	999	999	999	999	
9000	4.50	0.00	2.536	128	166	202	224	240	253	281	305	349	390	427	461	523	578	626	670	708	743	774	801	825	865	895	918	936	964	988	999	999	999	999	
9400	3.90	0.00	1.879	132	168	206	230	246	261	291	318	369	417	462	504	583	654	715	767	810	844	872	894	911	937	954	965	973	985	995	999	999	999	999	
9400	3.95	0.00	1.924	132	169	206	229	246	260	290	316	366	413	458	499	577	646	707	759	802	837	865	888	906	933	951	963	972	984	994	999	999	999	999	
9400	4.00	0.00	1.968	132	169	206	229	246	259	289	315	364	410	454	495	570	638	698	750	793	829	858	882	901	929	948	961	970	983	994	999	999	999	999	
9500	1.50	0.00	.315	156	184	254	369	460	531	663	757	869	924	952	968	984	990	994	995	997	997	998	998	999	999	999	999	999	999	999	999	999	999		
9500	2.00	0.00	.549	139	165	232	294	341	380	469	553	692	790	854	896	942	965	977	984	988	991	993	994	995	997	997	998	998	999	999	999	999	999	999	
9500	2.50	0.00	.819	133	164	221	262	292	317	375	431	541	640	723	785	868	915	943	959	970	977	982	986	988	992	994	995	996	998	999	999	999	999	999	
9500	3.00	0.00	1.134	132	165	214	245	267	287	329	370	448	524	596	661	764	836	883	915	936	951	961	969	975	982	987	990	992	996	998	999	999	999	999	
9500	3.50	0.00	1.502	134	168	210	235	254	270	305	336	396	453	508	561	657	736	798	844	879	904	923	938	949	965	974	981	985	992	997	999	999	999	999	
9500	3.90	0.00	1.838	134	170	208	231	248	262	293	326	371	419	465	508	589	661	723	775	817	851	878	899	916	940	956	967	975	986	995	999	999	999	999	
9500	4.00	0.00	1.929	135	171	208	231	247	261	290	317	366	412	456	498	575	644	705	757	801	836	864	887	906	933	951	963	972	984	994	999	999	999	999	
9500	4.50	0.00	2.363	140	173	208	229	244	257	282	305	348	387	424	459	523	581	634	681	724	761	794	822	846	866	885	913	933	948	971	991	999	999	999	
10000	1.50	0.00	.263	187	217	299	429	531	605	731	812	903	945	966	977	988	993	995	997	998	998	999	999	999	999	999	999	999	999	999	999	999	999	999	
10000	2.00	0.00	.471	159	189	264	335	387	432	531	617	748	833	886	919	956	973	982	988	991	993	994	996	996	997	998	998	999	999	999	999	999	999	999	
10000	2.50	0.00	.707	150	184	245	289	322	351	419	484	603	700	774	829	898	935	956	969	977	983	986	989	991	994	995	996	997	998	999	999	999	999	999	
10000	3.00	0.00	.983	147	182	233	285	290	310	358	403	493	578	654	718	812	872	910	935	952	963	971	977	981	987	990	993	994	997	999	999	999	999	999	
10000	3.50	0.00	1.314	147	184	226	252	271	288	324	358	424	488	550	609	709	785	840	879	907	928	943	954	962	974	981	986	989	994	998	999	999	999	999	
10000	4.00	0.00	1.721	151	184	220	243	259	273	303	330	381	431	478	524	609	684	747	798	838	869	894	913	928	949	963	972	979	988	996	999	999	999	999	999
10000	4.50	0.00	2.194	152	184	217	238	253	265	290	313	356	396	434	470	538	601	658	709	754	792	824	851	873	907	931	948	960	978	993	999	999	999	999	999
10500	4.00	0.00	1.538	157	197	235	258	275	290	320	349	404	457	510	560	651	727	787	833	868	895	915	931	943	960	971	978	983	991	997	999	999	999	999	999
11000	2.00	0.00	.374	203	238	327	409	470	520	621	702	814	881	920	945	970	982	988	992	994	995	996	997	997	998	998	999	999	999	999	999	999	999	999	999
11000	2.50	0.00	.575	185	224	295	346	386	421	498	567	683	769	830	874	926	954	969	978	984	988	990	992	994	995	996	997	998	999	999	999	999	999	999	999
11000	3.00	0.00	.803	177	215	274	311	340	364	421	475	574	659	729	785	862	908	936	954	966	974	980	984	987	991	993	995	996	997	999	999	999	999	999	999
11000	3.50	0.00	1.072	173	215	260	289	311	330	372	412	490	563	630	688	780	843	886	916	936	950	961	968	974	982	987	990	992	996	998	999	999	999	999	999
11000	4.00	0.00	1.398	171	211	251	275	293	308	340	370	430	488	543	596	688	760	816	857	888	912	929	942	952	962	967	976	982	986	992	997	999	999	999	999
11000	4.50	0.00	1.804	172	208	244	265	280	293	319	343	390	434	477	519	599	669	729	779	819	852	878	899	915	939	956	967	974	986	995	999	999	999	999	999
11500	4.00	0.00	1.290	187	227	268	293	312	327	362	394	457	517	575	627	717	785	837	874	902	923	938	950	959	971	979	984	988	993	996	999	999	999	999	999
12000	2.00	0.00	.310	247	286	384	469	534	585	683	758	856																							

TABLE 8D—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0	
13000	2.00	0.00	.259	285	328	430	518	583	636	733	803	889	933	957	971	985	991	994	996	997	997	998	998	999	999	999	999	999	999	000	
13000	2.50	0.00	.431	257	301	382	441	485	522	601	667	769	839	886	918	933	971	981	987	990	992	994	995	996	997	998	998	999	999	000	
13000	3.00	0.00	.617	243	287	354	398	430	458	519	574	669	744	803	847	905	938	958	970	978	983	987	989	991	994	995	996	997	998	999	
13000	3.50	0.00	.829	236	280	334	369	394	416	463	508	588	671	719	769	843	911	922	924	927	929	932	935	937	938	941	943	945	947	949	
13000	4.00	0.00	1.076	232	272	319	347	368	388	423	458	524	586	642	691	772	831	873	904	926	942	953	962	969	978	984	988	991	995	996	
13000	4.50	0.00	1.374	230	266	307	331	348	362	393	421	475	526	574	619	697	761	811	850	880	903	921	935	946	962	972	979	984	991	997	
14000	2.00	0.00	.215	322	366	471	561	630	684	781	845	918	953	971	980	990	994	996	997	998	998	999	999	999	999	999	999	999	999	000	
14000	2.50	0.00	.382	287	331	414	473	519	557	636	702	799	864	905	932	962	977	985	989	992	994	995	996	997	998	998	999	999	999	000	
14000	3.00	0.00	.557	272	316	384	429	463	491	553	607	699	771	826	866	916	947	964	975	981	986	989	991	993	995	996	997	997	998	999	
14000	3.50	0.00	.753	264	307	364	400	426	448	496	540	620	689	746	793	861	905	933	951	963	972	978	982	985	990	992	994	995	997	999	
14000	4.00	0.00	.981	259	299	348	378	399	417	455	491	558	618	672	719	795	850	888	916	935	949	960	967	973	981	980	982	984	992	996	
14000	4.50	0.00	1.251	257	292	333	360	378	393	425	454	509	560	607	651	726	786	832	868	895	916	932	944	954	967	976	982	986	992	997	
15000	2.00	0.00	.173	360	404	511	607	681	737	832	888	946	970	982	988	994	996	997	998	999	999	999	999	999	999	999	999	999	999	000	
15000	2.50	0.00	.339	315	359	442	502	549	589	669	734	827	885	922	945	970	981	988	991	994	995	996	997	997	998	998	999	999	999	000	
15000	3.00	0.00	.507	299	342	410	455	489	519	581	635	726	795	846	883	930	955	970	978	984	988	990	992	994	995	997	997	998	999	999	
15000	3.50	0.00	.693	290	331	388	425	452	475	524	568	646	713	768	812	876	916	941	957	968	975	981	984	987	991	993	995	996	998	999	
15000	4.00	0.00	.904	285	323	372	403	425	444	483	519	585	644	697	742	814	865	900	925	943	955	965	971	977	984	988	991	993	996	996	
15000	4.50	0.00	1.155	283	316	359	385	404	419	453	482	537	584	631	676	748	803	848	881	906	925	939	951	959	971	979	984	988	993	998	
16000	2.00	0.00	.130	406	450	563	665	744	803	889	932	970	984	990	994	997	998	999	999	999	999	999	999	999	999	999	999	999	999	000	
16000	2.50	0.00	.299	345	387	469	530	579	620	702	765	853	905	937	956	976	986	990	993	995	996	997	997	998	998	999	999	999	999	000	
16000	3.00	0.00	.463	325	366	432	478	513	543	607	661	749	815	863	897	939	961	974	982	986	990	992	993	994	996	997	998	998	999	999	
16000	3.50	0.00	.640	315	353	410	447	475	498	548	592	669	734	787	830	889	925	948	962	972	978	983	986	989	992	994	996	996	998	999	
16000	4.00	0.00	.840	310	344	393	425	448	467	507	543	608	666	718	762	830	878	910	933	949	960	969	975	979	986	990	992	994	996	999	
16000	4.50	0.00	1.075	307	338	380	407	426	442	476	506	563	628	686	736	779	844	889	919	940	954	965	972	978	982	987	991	993	995	997	999
17000	2.00	0.00	.087	465	510	634	753	836	889	948	971	988	994	996	998	999	999	999	999	999	999	999	999	999	999	999	999	999	999	000	
17000	2.50	0.00	.260	375	414	495	559	610	652	736	798	879	925	951	966	982	989	993	995	996	997	998	998	999	999	999	999	999	999	000	
17000	3.00	0.00	.423	352	388	453	499	535	566	631	685	772	830	880	911	948	967	978	984	988	991	993	994	995	997	997	998	998	999	999	
17000	3.50	0.00	.593	340	374	429	467	495	519	569	613	690	754	805	845	900	934	954	967	975	981	985	988	990	993	995	996	997	998	999	
17000	4.00	0.00	.784	334	365	413	444	468	487	527	563	628	686	736	779	844	889	919	940	954	965	972	978	982	987	991	993	995	997	999	
17000	4.50	0.00	1.006	331	359	399	426	446	462	496	527	581	631	676	716	783	835	873	902	923	939	951	960	967	971	979	985	989	991	995	998
18000	2.50	0.00	.222	403	441	523	590	644	689	774	833	905	943	963	975	987	992	995	996	997	998	998	999	999	999	999	999	999	999	000	
18000	3.00	0.00	.384	376	409	472	520	557	589	655	709	794	854	895	923	956	972	982	987	990	993	994	995	996	997	998	998	999	999	000	
18000	3.50	0.00	.550	365	395	447	485	514	539	589	634	710	772	821	859	911	941	959	971	978	983	986	988	990	993	995	995	996	998	999	
18000	4.00	0.00	.733	358	385	430	462	486	505	546	582	647	704	753	794	857	899	927	946	959	968	975	980	984	989	992	994	995	997	999	
18000	4.50	0.00	.944	355	379	417	444	464	484	515	545	600	649	693	733	798	847	884	911	930	945	956	964	971	979	985	989	991	995	998	
20000	2.50	0.00	.148	463	504	597	677	739	785	860	905	951	972	983	988	994	996	997	998	999	999	999	999	999	999	999	999	999	999	000	
20000	3.00	0.00	.312	413	445	511	563	604	638	706	760	839	890	923	945	969	981	987	991	993	995	996	997	997	998	998	999	999	999	000	
20000	3.50	0.00	.472	400	428	479	519	550	576	628	673	748	807	852	886	930	954	969	978	983	987	990	992	993	995	996	997	998	998	999	
20000	4.00	0.00	.643	394	418	461	493	518	538	580	617	682	738	785	823	880	916	940	956	967	975	980	984	987	991	993	995	996	998	999	
20000	4.50	0.00	.837	392	413	448	475	495	512	548	578	633	682	725	763	824	869	902	925	942	954	964	971	976	983	988	991	993	996	998	
22500	3.00	0.00	.230	467	500	572	632	678	713	780	828	892	929	952	966	982	989	992	995	996	997	997	998	998	999	999	999	999	999	000	
22500	3.50	0.00	.383	436	463	517	562	597	624	680	726	798	850	888	915	949	967	978	984	988	991	993	994	995	997	997	998	998	999	999	
22500	4.00	0.00	.544	426	449	493	528	555	577	622	660	725	778	822	856	905	935	954	967	975	981	985	988	990	993	995	996	997	998	999	
22500	4.50	0.00	.722	423	442	478	506	528	547	584	616	672	720	761	797	853	893	921	940	954	964	972	977	981	987	991	993	994	997	999	
25000	3.00	0.00	.163	538	569	637	698	744	779	841	882	932	958	973	982	990	994	996	997	998	998	999	999	999	999	999	999	999	999	000	
25000	3.50	0.00	.310	482	508	562	610	647	676	732	775	840	884	913	923	937	943	949	955	961	967	973	978	984	989	992	994	995	997	999	999
25000	4.00	0.00	.456	461	483	525	563	593	617	666	705	768	817	855																	

TABLE 8D—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
30000	3.50	0.00	.184	593	614	659	703	739	768	822	862	913	943	962	973	985	991	994	996	997	997	998	998	998	999	999	999	999	999	000
30000	4.00	0.00	.378	544	561	597	631	660	684	733	771	830	872	902	925	954	970	980	986	989	992	994	995	996	997	998	998	998	999	999
30000	4.50	0.00	.468	527	542	570	597	621	641	683	717	772	814	848	876	916	941	958	969	977	982	986	989	991	994	995	996	997	998	999
30000	5.00	0.00	.625	519	531	554	575	594	612	647	677	726	766	799	828	873	905	929	946	958	967	974	979	982	988	991	993	995	997	999
35000	3.50	0.00	.072	759	780	824	860	885	904	934	953	974	985	990	993	996	998	998	999	999	999	999	999	999	999	999	999	999	999	000
35000	4.00	0.00	.184	659	676	710	742	767	789	832	864	908	936	955	967	981	988	992	994	996	997	997	998	998	999	999	999	999	999	000
35000	4.50	0.00	.316	619	631	656	680	700	718	756	787	836	873	901	923	951	968	978	984	988	991	993	994	995	997	998	998	998	999	000
35000	5.00	0.00	.454	608	617	636	654	670	684	715	741	785	821	850	875	912	937	954	966	974	980	984	987	990	993	995	996	997	998	999
40000	4.00	0.00	.117	750	765	795	823	845	861	892	914	944	964	963	974	982	990	994	996	997	996	998	998	999	999	999	999	999	999	000
40000	4.50	0.00	.195	720	731	755	778	796	812	841	864	899	925	943	956	973	983	988	992	994	995	996	997	997	998	999	999	999	999	000
40000	5.00	0.00	.285	706	714	732	749	764	777	803	824	858	886	907	925	949	965	975	982	987	990	992	994	995	996	997	998	999	999	000
45000	4.50	0.00	.155	760	770	791	812	829	843	870	890	921	942	957	967	981	988	992	994	996	997	997	998	998	999	999	999	999	999	000
45000	5.00	0.00	.220	756	763	778	794	807	819	842	861	890	912	930	944	963	975	982	987	990	993	994	995	996	997	998	998	999	999	000
50000	4.50	0.00	.130	786	795	815	835	851	864	889	908	934	953	965	974	985	990	993	995	997	997	998	998	999	999	999	999	999	999	000
50000	5.00	0.00	.188	779	786	800	815	828	839	862	879	905	925	941	953	969	979	986	990	992	994	995	996	997	998	999	999	999	999	000
5500	2.50	-1.00	.216	172	226	427	622	703	750	821	865	917	945	962	973	984	990	994	996	997	998	998	999	999	999	999	999	999	999	000
5500	2.50	-1.00	.190	183	260	507	656	725	769	840	882	930	955	969	978	988	993	995	997	998	998	999	999	999	999	999	999	999	999	000
5500	3.00	-1.00	.164	198	317	564	683	748	792	860	899	942	964	976	983	991	995	997	998	998	999	999	999	999	999	999	999	999	999	000
5500	3.50	-1.00	.164	216	371	598	707	769	812	877	914	952	971	981	987	993	996	998	998	999	999	999	999	999	999	999	999	999	999	000
5500	4.00	-1.00	.131	239	413	619	722	785	826	888	923	959	976	984	989	995	997	998	999	999	999	999	999	999	999	999	999	999	999	000
5500	4.50	-1.00	.138	269	440	589	687	755	802	877	917	958	976	985	990	995	997	998	999	999	999	999	999	999	999	999	999	999	999	000
6000	2.00	-1.00	.410	149	183	300	471	554	603	680	734	810	859	894	918	948	965	975	982	987	990	992	994	995	997	998	998	999	999	000
6000	2.50	-1.00	.379	162	201	370	506	574	619	697	752	826	872	904	926	953	969	978	984	988	991	993	994	995	997	998	998	999	999	000
6000	3.00	-1.00	.339	174	236	419	530	594	639	719	774	845	889	918	937	961	974	982	987	990	993	994	995	996	998	999	999	999	999	000
6000	3.50	-1.00	.300	187	272	450	552	614	662	744	798	866	906	931	948	968	980	986	990	993	994	996	997	997	998	999	999	999	999	000
6000	4.00	-1.00	.265	201	301	473	573	639	687	769	821	885	921	943	958	975	984	989	992	995	996	997	998	998	999	999	999	999	999	000
6000	4.50	-1.00	.250	218	330	484	573	635	685	772	827	892	928	949	963	979	987	991	994	996	997	997	998	998	999	999	999	999	999	000
6500	2.00	-1.00	.638	131	159	246	366	434	478	552	608	695	760	809	846	896	928	947	961	970	977	982	985	988	992	994	996	997	998	999
6500	2.50	-1.00	.631	144	178	293	394	451	492	566	621	705	767	814	849	896	926	946	960	969	976	981	984	987	991	993	995	996	998	999
6500	3.00	-1.00	.601	158	203	326	414	468	508	583	639	722	781	825	858	902	930	948	961	970	977	981	985	988	991	994	995	997	998	999
6500	3.50	-1.00	.560	172	228	349	430	483	524	602	660	743	800	840	871	912	937	954	965	973	979	983	986	989	992	994	996	997	998	999
6500	4.00	-1.00	.508	187	250	367	446	500	543	624	684	767	821	859	887	924	946	961	971	977	982	986	989	991	994	995	997	997	999	000
6500	4.50	-1.00	.464	201	269	382	459	514	558	642	702	784	837	873	899	933	954	967	975	981	986	989	991	993	995	996	997	998	999	000
7000	2.00	-1.00	.882	114	139	208	292	343	380	449	503	591	663	722	770	839	883	913	934	949	960	968	974	979	985	989	992	994	996	999
7000	2.50	-1.00	.885	128	161	243	312	358	393	460	513	600	670	726	771	837	880	909	930	945	957	965	972	977	984	988	991	993	996	999
7000	3.00	-1.00	.893	142	185	265	328	371	405	472	524	609	676	730	772	834	876	906	927	942	953	962	969	974	982	987	990	992	996	999
7000	3.50	-1.00	.875	157	208	284	342	386	420	487	540	624	689	740	780	839	878	906	927	942	953	961	968	973	981	986	990	992	996	999
7000	4.00	-1.00	.838	174	224	299	357	401	436	504	558	642	706	755	793	848	885	911	930	944	955	963	969	974	982	987	990	992	996	999
7000	4.50	-1.00	.787	190	242	314	372	417	453	522	576	661	723	770	806	859	894	918	936	949	959	966	972	977	983	988	991	993	996	999
7500	2.00	-1.00	1.172	101	123	178	237	276	305	363	413	497	569	631	682	762	819	862	893	917	934	947	957	965	975	982	986	990	994	998
7500	2.50	-1.00	1.150	116	147	209	258	293	321	378	426	509	581	642	695	773	828	866	895	917	933	945	955	962	973	981	985	989	994	998
7500	3.00	-1.00	1.168	130	172	230	273	306	333	390	437	516	583	642	692	769	823	862	890	912	929	941	951	959	971	978	984	987	993	998
7500	3.50	-1.00	1.193	146	190	247	287	319	346	402	448	524	589	644	692	765	817	855	884	906	923	936	947	955	967	976	981	986	992	997
7500	4.00	-1.00	1.192	162	209	261	300	332	359	415	461	537	600	654	698	768	817	854	881	903	923	934	943	952	965	974	980	985	991	997
7500	4.50	-1.00	1.171	180	225	274	313	345	373	431	477	551	612	664	708	774	821	856	883	904	920	933	944	952	965	973	980	984	991	997

TABLE 8D—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
8000	2.00	-1.00	1.123	103	124	173	221	254	280	334	382	467	541	608	668	767	836	883	915	936	951	961	969	975	983	987	990	993	996	998
8000	2.50	-1.00	1.407	110	136	186	223	249	271	319	361	435	498	555	606	692	761	815	856	888	911	929	942	952	967	976	982	986	992	997
8000	3.00	-1.00	1.532	122	152	205	236	260	281	326	366	436	498	554	604	685	747	795	832	866	905	921	933	952	964	973	979	988	996	
8000	3.50	-1.00	1.501	141	176	221	251	278	306	340	380	448	508	562	611	693	755	802	838	866	889	908	922	934	951	964	972	979	988	996
8000	4.00	-1.00	1.524	154	195	237	265	288	308	352	391	458	516	568	615	693	752	798	833	861	883	901	916	928	947	960	969	976	987	996
8000	4.50	-1.00	1.542	171	211	250	278	301	321	365	404	470	527	577	622	696	753	796	830	857	879	896	911	923	942	956	966	973	985	995
8500	2.00	-1.00	.909	112	137	186	232	266	292	350	402	502	594	677	745	842	898	931	951	964	973	979	983	986	990	993	994	996	997	999
8500	2.50	-1.00	1.246	108	134	191	222	247	268	314	356	433	503	568	627	729	804	858	895	920	939	952	961	968	978	984	988	991	995	998
8500	3.00	-1.00	1.595	108	152	195	220	240	258	297	333	398	459	509	558	644	716	776	823	859	887	909	926	939	957	969	977	982	990	998
8500	3.50	-1.00	1.945	90	151	198	222	240	256	291	323	381	432	478	520	593	656	710	756	796	829	856	879	897	925	945	958	968	982	994
8500	4.00	-1.00	2.257	131	173	208	229	246	261	293	323	375	422	464	501	572	634	671	713	749	782	810	834	855	889	915	934	948	971	990
8500	4.50	-1.00	2.499	140	185	220	241	257	271	302	330	381	424	463	498	558	609	652	690	724	753	780	803	824	859	887	909	927	957	985
9000	2.00	-1.00	.698	138	160	212	261	299	329	397	464	591	699	780	838	907	942	962	973	980	985	988	991	992	995	996	997	998	999	999
9000	2.50	-1.00	1.014	132	158	206	241	266	288	338	386	475	559	636	703	804	869	909	935	952	963	971	977	981	987	990	993	994	997	999
9000	3.00	-1.00	1.377	130	162	202	229	249	267	306	343	411	475	535	591	690	769	827	869	900	922	938	950	959	972	979	985	988	993	998
9000	3.50	-1.00	1.780	128	167	202	223	241	256	289	319	376	429	477	522	604	676	736	787	827	860	885	905	921	944	959	969	977	987	996
9000	4.00	-1.00	2.194	129	170	204	224	239	252	282	308	358	403	445	484	553	614	667	715	756	791	822	848	870	904	928	945	957	976	992
9000	4.50	-1.00	2.577	140	179	211	229	243	255	282	306	351	392	430	464	525	579	626	668	706	739	769	796	819	859	889	913	931	960	987
9500	2.00	-1.00	.563	163	189	245	300	342	379	461	544	680	779	845	889	938	962	975	983	987	990	992	994	995	996	997	998	998	999	999
9500	2.50	-1.00	.838	153	180	229	265	293	318	374	429	535	631	711	775	861	910	939	957	968	976	981	985	988	991	994	995	996	998	999
9500	3.00	-1.00	1.163	149	180	219	246	268	286	329	368	445	518	587	651	754	827	876	909	931	947	958	967	973	981	986	990	992	995	998
9500	3.50	-1.00	1.547	146	182	215	236	254	269	302	334	393	450	504	554	647	725	786	834	870	897	917	933	945	961	972	979	984	991	997
9500	4.00	-1.00	1.990	145	181	212	231	246	259	287	313	363	409	453	494	569	636	695	746	789	825	854	878	898	926	946	959	969	983	994
9500	4.50	-1.00	2.449	151	185	214	231	244	256	280	303	346	386	424	459	523	580	631	677	717	754	786	814	838	877	906	927	943	968	990
10000	2.00	-1.00	.482	187	215	277	338	387	429	523	607	737	824	879	914	933	971	981	987	990	993	994	995	996	997	998	998	999	999	999
10000	2.50	-1.00	.721	177	206	256	294	325	353	417	479	595	691	766	821	892	931	954	967	976	982	986	988	990	993	995	996	997	998	999
10000	3.00	-1.00	1.000	173	202	243	270	293	313	359	403	490	572	646	710	805	867	906	932	949	961	969	975	980	986	990	992	994	996	999
10000	3.50	-1.00	1.345	169	201	233	255	273	289	324	357	421	484	544	600	699	775	832	873	902	923	939	951	960	972	980	985	988	993	998
10000	4.00	-1.00	1.759	173	199	226	246	261	274	302	328	380	429	475	520	603	676	739	790	830	862	888	907	923	946	960	970	977	987	996
10000	4.50	-1.00	2.255	171	197	223	240	253	264	288	310	353	393	431	466	534	595	650	700	744	782	814	842	865	900	925	943	956	976	992
5500	2.00	-2.00	.196	184	238	424	638	725	773	842	883	930	955	969	978	988	993	995	997	998	998	999	999	999	999	999	999	999	999	999
5500	2.50	-2.00	.166	194	252	501	680	755	800	867	905	946	966	978	984	992	995	997	998	998	999	999	999	999	999	999	999	999	999	999
5500	3.00	-2.00	.139	205	298	572	717	786	828	890	924	959	976	984	989	994	997	998	999	999	999	999	999	999	999	999	999	999	999	999
5500	3.50	-2.00	.118	220	365	627	752	812	852	909	939	969	982	989	992	996	998	999	999	999	999	999	999	999	999	999	999	999	999	999
5500	4.00	-2.00	.103	238	433	669	775	832	869	922	949	975	986	991	994	997	998	999	999	999	999	999	999	999	999	999	999	999	999	999
5500	4.50	-2.00	.106	265	454	617	734	804	851	916	948	976	987	992	995	998	999	999	999	999	999	999	999	999	999	999	999	999	999	999
6000	2.00	-2.00	.387	164	195	298	480	568	618	695	749	822	869	902	925	933	969	978	984	988	991	993	994	995	997	998	998	999	999	999
6000	2.50	-2.00	.351	176	209	369	517	590	636	714	768	840	884	913	934	959	973	981	987	990	992	994	995	996	997	998	999	999	999	999
6000	3.00	-2.00	.314	188	241	428	546	610	655	734	788	857	900	926	945	967	978	985	989	992	994	995	996	997	998	999	999	999	999	999
6000	3.50	-2.00	.267	200	275	465	575	639	688	768	821	894	920	943	957	975	984	989	992	994	996	997	997	998	999	999	999	999	999	999
6000	4.00	-2.00	.233	213	308	495	600	668	716	796	845	903	935	954	967	981	988	992	994	996	997	998	998	999	999	999	999	999	999	999
6000	4.50	-2.00	.217	227	339	506	598	664	715	800	853	912	943	961	972	984	990	994	996	997	998	999	999	999	999	999	999	999	999	999
6500	2.00	-2.00	.622	148	175	249	372	444	488	563	618	704	768	816	852	900	930	950	963	971	978	982	986	988	992	994	996	997	998	999
6500	2.50	-2.00	.602	163	191	300	404	463	504	579	635	718	778	824	857	902	931	950	962	971	978	982	986	988	992	994	996	997	998	999
6500	3.00	-2.00	.567	178	215	336	425	481	522	598	654	737	795	837	868	911	936	953	965	973	979	983	986	989	992	994	996	997	998	999
6500	3.50	-2.00	.520	192	237	360	444	498	540	619	670	760	815	854	882	921	944	959	970	977	982	985	988	990	993	995	996	997	998	999
6500	4.00	-2.00	.466	206	257	379	460	516	560	643	704	785	837	869	893	933	953	966	975											

TABLE 8D—Continued

TEFF	LOG G	LOG A	WIDTH	.00	.02	.04	.06	.08	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.8	3.2	3.6	4.0	5.0	7.0
7000	2.00	-2.00	.882	135	157	214	294	347	384	453	507	594	665	723	770	838	882	912	933	948	959	967	973	978	984	989	991	993	996	999
7000	2.50	-2.00	.860	153	179	249	319	366	401	469	523	610	677	734	779	843	884	913	933	948	959	967	973	978	984	988	991	993	996	999
7000	3.00	-2.00	.860	169	199	273	336	380	415	482	535	621	687	740	781	847	882	910	931	945	956	964	971	976	983	987	991	993	996	999
7000	3.50	-2.00	.838	186	218	291	352	396	431	499	552	636	700	750	790	857	885	912	931	945	956	964	971	975	983	987	990	993	996	999
7000	4.00	-2.00	.792	202	239	308	367	412	448	518	573	658	720	768	805	858	893	918	933	945	956	966	972	977	983	988	991	993	996	999
7000	4.50	-2.00	.739	217	252	322	382	428	465	536	591	677	738	784	820	870	904	926	942	954	963	970	975	979	985	989	992	994	997	999
7500	2.00	-2.00	1.143	123	141	186	242	281	311	370	421	506	579	641	693	771	826	867	896	919	936	949	958	966	976	982	987	990	994	998
7500	2.50	-2.00	1.125	141	164	215	263	298	328	384	435	516	588	650	702	786	833	871	899	920	936	947	954	964	974	981	986	989	994	998
7500	3.00	-2.00	1.136	159	186	237	279	312	339	397	445	526	598	651	701	776	823	861	895	915	932	944	954	961	972	979	984	988	993	998
7500	3.50	-2.00	1.158	177	210	253	292	324	352	409	455	533	598	654	701	773	824	860	888	910	926	938	949	957	969	977	983	987	993	998
7500	4.00	-2.00	1.152	195	226	265	303	338	366	423	470	548	611	665	709	777	825	861	887	907	923	936	947	955	967	975	981	985	992	997
7500	4.50	-2.00	1.120	214	243	281	319	352	381	440	487	563	625	677	720	784	831	865	890	910	925	938	948	956	968	976	981	986	992	997
8000	2.00	-2.00	1.142	120	136	176	222	253	279	333	381	465	539	605	664	761	831	878	911	933	948	959	967	973	982	987	990	992	995	998
8000	2.50	-2.00	1.413	129	149	190	224	250	272	320	362	436	501	558	609	694	761	813	854	885	909	926	940	951	965	975	981	985	992	997
8000	3.00	-2.00	1.499	146	168	207	239	263	284	330	371	442	505	562	613	695	756	802	838	866	889	908	922	935	953	965	974	980	989	996
8000	3.50	-2.00	1.470	167	193	227	254	278	299	345	385	454	514	569	618	700	761	807	842	870	892	910	925	936	953	965	973	979	989	996
8000	4.00	-2.00	1.484	185	215	244	269	292	312	357	397	465	525	578	626	707	761	805	840	867	888	905	919	931	949	961	970	979	989	996
8000	4.50	-2.00	1.498	205	232	258	283	305	325	371	411	478	536	587	631	705	761	803	836	863	884	901	915	927	945	958	967	975	986	995
8500	2.00	-2.00	.925	135	151	189	233	266	292	349	402	499	589	670	738	835	893	927	948	962	971	977	982	985	990	992	994	996	997	999
8500	2.50	-2.00	1.265	136	154	190	222	247	267	314	356	433	502	566	624	723	798	852	890	917	935	949	959	967	977	983	987	990	994	998
8500	3.00	-2.00	1.616	141	159	192	219	239	257	297	333	399	457	510	558	642	713	771	818	854	883	905	922	936	955	967	975	981	990	996
8500	3.50	-2.00	1.961	149	175	202	222	240	256	291	324	382	434	480	521	594	656	709	754	793	825	853	875	894	923	942	956	966	981	994
8500	4.00	-2.00	2.262	161	188	211	230	246	261	294	324	378	426	467	505	570	625	672	713	750	781	808	833	853	887	913	932	947	970	990
8500	4.50	-2.00	2.481	179	203	225	242	258	272	304	334	386	431	470	505	564	614	657	695	727	756	782	805	825	860	887	909	927	957	985
9000	2.00	-2.00	.710	164	179	219	263	299	328	395	460	584	690	772	831	903	940	960	972	979	984	988	990	992	994	996	997	997	998	999
9000	2.50	-2.00	1.035	159	173	209	240	265	287	336	382	469	551	627	694	796	863	904	931	949	961	969	976	980	986	990	992	994	996	999
9000	3.00	-2.00	1.402	158	173	203	228	248	265	305	341	409	472	531	586	684	762	821	864	895	918	935	948	957	970	978	984	988	993	997
9000	3.50	-2.00	1.803	161	180	204	223	240	255	288	319	376	428	477	522	602	672	732	782	823	855	881	902	918	942	957	968	976	987	995
9000	4.00	-2.00	2.214	166	187	207	224	238	251	280	307	358	404	445	484	553	613	666	712	753	788	819	844	866	901	925	943	956	975	992
9000	4.50	-2.00	2.588	177	196	215	230	243	253	281	306	352	394	431	466	527	581	627	669	706	739	768	794	818	857	887	911	929	959	986
9500	2.00	-2.00	.574	192	207	248	298	339	374	456	535	671	771	839	884	935	966	974	982	987	990	992	993	995	996	997	998	998	999	999
9500	2.50	-2.00	.854	184	199	233	265	292	316	371	424	527	622	703	767	855	906	936	954	966	974	980	984	987	991	993	995	996	997	999
9500	3.00	-2.00	1.185	181	194	223	247	267	285	326	365	440	512	580	643	746	820	870	904	928	944	956	965	971	980	986	989	992	995	998
9500	3.50	-2.00	1.576	181	196	218	236	253	268	301	332	391	447	499	549	640	717	780	828	864	892	913	929	942	959	971	978	983	991	997
9500	4.00	-2.00	2.023	182	198	215	231	245	258	285	311	361	407	450	490	565	631	689	740	783	819	849	874	893	923	943	957	967	982	994
9500	4.50	-2.00	2.495	186	201	216	230	243	253	277	300	343	383	420	455	518	575	625	671	711	747	780	808	832	872	902	924	941	967	989
10000	2.00	-2.00	.493	216	232	279	334	380	421	514	597	729	817	874	910	951	970	980	986	990	992	994	995	996	997	998	998	998	999	999
10000	2.50	-2.00	.736	206	221	256	291	321	348	410	471	586	682	758	815	888	928	952	966	975	981	985	988	990	993	995	996	997	998	999
10000	3.00	-2.00	1.021	203	216	243	268	289	309	354	398	483	564	637	701	798	861	902	929	947	959	968	974	979	985	989	992	994	996	998
10000	3.50	-2.00	1.374	201	214	234	253	270	285	320	353	416	478	527	592	691	768	825	867	897	920	936	948	958	971	979	984	988	993	997
10000	4.00	-2.00	1.792	205	214	229	245	259	272	300	326	377	425	471	515	597	669	732	783	824	857	883	903	920	943	958	969	976	987	996
10000	4.50	-2.00	2.291	201	212	226	240	252	262	286	308	350	390	427	463	530	590	645	695	738	776	809	837	860	896	922	941	954	975	992

APPENDIX

ROSSELAND MEAN OPACITIES

The distribution functions for line opacity described in § III plus the continuum opacity were used to compute the Rosseland mean opacities shown in Table 9. The integration was performed over the same wavelength range as was used in the model calculation. As discussed in § III and shown in Table 1, the line opacity was not computed for high N_e and low T or for low N_e and high T but, rather, was extrapolated from the calculated values, so the tabulated Rosseland mean should be less reliable for those cases. The regions of extrapolation are delimited by lines in the tables. The mean opacity is underestimated at low temperatures because molecular lines were not included, and also at the highest temperatures because spectroscopic data were not always available for the higher stages of ionization. Nevertheless, these opacities are adequate to produce reliable temperature structures at large optical depths and to predict the total flux from a model to within a few percent.

TABLE 9
ROSSELLAND MASS ABSORPTION COEFFICIENT FOR LOGARITHMIC ABUNDANCES

A. LOG ABUNDANCE 0.00

Table with two main sections. The first section has columns for LOG T and LOG P (ranging from -2.00 to 3.00). The second section has columns for LOG T and LOG P (ranging from 3.20 to 6.00). Each section contains a grid of numerical values representing mass absorption coefficients.

TABLE 9
B. LOG ABUNDANCE -1.00

LOG T	LOG P														
	-2.00	-1.50	-1.00	-.50	0.00	.50	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
3.500	-4.878	-4.883	-4.883	-4.878	-4.863	-4.826	-4.745	-4.682	-4.606	-4.515	-4.413	-4.299	-4.176	-4.045	-3.906
3.525	-4.745	-4.798	-4.822	-4.823	-4.803	-4.751	-4.645	-4.568	-4.474	-4.363	-4.238	-4.102	-3.959	-3.811	-3.661
3.550	-4.457	-4.577	-4.669	-4.725	-4.738	-4.699	-4.590	-4.504	-4.396	-4.268	-4.124	-3.967	-3.802	-3.632	-3.462
3.575	-4.083	-4.240	-4.379	-4.494	-4.572	-4.593	-4.526	-4.452	-4.348	-4.218	-4.063	-3.891	-3.709	-3.521	-3.332
3.600	-3.671	-3.853	-4.019	-4.166	-4.283	-4.353	-4.348	-4.306	-4.235	-4.132	-3.998	-3.873	-3.656	-3.462	-3.261
3.625	-3.240	-3.442	-3.629	-3.798	-3.936	-4.027	-4.047	-4.023	-3.974	-3.900	-3.802	-3.680	-3.537	-3.374	-3.193
3.650	-2.805	-3.021	-3.226	-3.412	-3.568	-3.673	-3.701	-3.681	-3.638	-3.574	-3.491	-3.390	-3.276	-3.148	-3.008
3.675	-2.373	-2.600	-2.818	-3.019	-3.192	-3.312	-3.349	-3.331	-3.290	-3.229	-3.150	-3.056	-2.952	-2.839	-2.719
3.700	-1.952	-2.186	-2.411	-2.624	-2.811	-2.947	-2.998	-2.985	-2.947	-2.888	-2.812	-2.721	-2.621	-2.514	-2.400
3.725	-1.548	-1.782	-2.011	-2.229	-2.425	-2.575	-2.644	-2.638	-2.607	-2.553	-2.481	-2.394	-2.297	-2.192	-2.083
3.750	-1.169	-1.395	-1.621	-1.838	-2.037	-2.195	-2.279	-2.284	-2.262	-2.215	-2.150	-2.068	-1.976	-1.877	-1.771
3.775	-.847	-1.040	-1.249	-1.457	-1.650	-1.809	-1.903	-1.916	-1.904	-1.869	-1.812	-1.740	-1.655	-1.561	-1.461
3.800	-.642	-.754	-.915	-1.096	-1.272	-1.421	-1.517	-1.536	-1.533	-1.508	-1.463	-1.402	-1.327	-1.243	-1.152
3.825	-.564	-.595	-.667	-.783	-.919	-1.043	-1.127	-1.147	-1.149	-1.133	-1.099	-1.050	-.988	-.915	-.834
3.850	-.545	-.542	-.545	-.569	-.626	-.697	-.750	-.763	-.763	-.751	-.724	-.685	-.635	-.575	-.506
3.875	-.543	-.532	-.512	-.478	-.443	-.423	-.414	-.407	-.394	-.375	-.348	-.314	-.272	-.223	-.167
3.900	-.546	-.535	-.511	-.462	-.380	-.271	-.165	-.117	-.074	-.033	.004	.043	.084	.128	.176
3.925	-.549	-.540	-.519	-.473	-.382	-.233	-.040	.059	.153	.234	.303	.363	.416	.465	.514
3.950	-.550	-.544	-.528	-.490	-.407	-.255	-.027	.109	.250	.384	.504	.605	.690	.761	.819
3.975	-.545	-.545	-.535	-.506	-.436	-.299	-.073	.074	.239	.410	.579	.733	.867	.976	1.064
4.000	-.529	-.537	-.536	-.517	-.463	-.346	-.137	.005	.172	.356	.551	.744	.927	1.086	1.221
4.050	-.507	-.508	-.510	-.509	-.489	-.420	-.269	-.154	-.011	.158	.351	.561	.781	1.001	1.217
4.100	-.502	-.500	-.497	-.492	-.478	-.440	-.349	-.272	-.168	-.036	.124	.310	.516	.738	.970
4.150	-.502	-.497	-.492	-.486	-.475	-.449	-.385	-.331	-.257	-.160	-.039	.106	.275	.470	.685
4.200	-.505	-.501	-.495	-.486	-.474	-.453	-.411	-.374	-.322	-.249	-.155	-.037	.102	.266	.454
4.250	-.503	-.501	-.498	-.490	-.478	-.459	-.427	-.401	-.363	-.310	-.240	-.150	-.038	.099	.264
4.300	-.498	-.498	-.496	-.491	-.481	-.464	-.437	-.417	-.390	-.352	-.301	-.231	-.142	-.030	.107
4.350	-.470	-.478	-.485	-.487	-.482	-.467	-.441	-.422	-.400	-.372	-.334	-.283	-.215	-.127	-.015
4.400	-.463	-.461	-.461	-.463	-.466	-.463	-.444	-.427	-.406	-.379	-.346	-.304	-.252	-.185	-.096
4.450	-.462	-.461	-.459	-.457	-.453	-.446	-.434	-.423	-.406	-.382	-.351	-.313	-.267	-.210	-.137
4.500	-.459	-.459	-.458	-.457	-.454	-.448	-.436	-.425	-.409	-.386	-.355	-.316	-.268	-.213	-.149
4.600	-.451	-.450	-.450	-.449	-.449	-.447	-.444	-.441	-.435	-.426	-.412	-.389	-.355	-.307	-.241
4.700	-.437	-.438	-.439	-.439	-.439	-.438	-.437	-.436	-.435	-.432	-.428	-.421	-.410	-.392	-.363
4.800	-.435	-.434	-.434	-.434	-.434	-.433	-.432	-.432	-.431	-.430	-.428	-.426	-.422	-.416	-.407
4.900	-.436	-.436	-.435	-.435	-.435	-.434	-.432	-.432	-.431	-.431	-.430	-.429	-.427	-.425	-.422
5.000	-.446	-.445	-.444	-.443	-.442	-.441	-.440	-.440	-.439	-.438	-.438	-.437	-.436	-.434	-.432

LOG T	LOG P														
	3.20	3.40	3.60	3.80	4.00	4.20	4.40	4.60	4.80	5.00	5.20	5.40	5.60	5.80	6.00
3.500	-3.790	-3.669	-3.543	-3.412	-3.276	-3.135	-2.991	-2.845	-2.696	-2.546	-2.396	-2.247	-2.098	-1.951	-1.806
3.525	-3.541	-3.419	-3.297	-3.173	-3.048	-2.920	-2.789	-2.654	-2.517	-2.376	-2.233	-2.088	-1.941	-1.794	-1.647
3.550	-3.328	-3.195	-3.065	-2.937	-2.811	-2.685	-2.560	-2.434	-2.307	-2.177	-2.046	-1.912	-1.775	-1.635	-1.494
3.575	-3.182	-3.034	-2.889	-2.748	-2.610	-2.477	-2.346	-2.217	-2.090	-1.965	-1.839	-1.712	-1.585	-1.456	-1.325
3.600	-3.099	-2.939	-2.780	-2.624	-2.472	-2.324	-2.179	-2.040	-1.904	-1.772	-1.643	-1.516	-1.391	-1.267	-1.142
3.625	-3.040	-2.880	-2.718	-2.555	-2.393	-2.232	-2.075	-1.922	-1.772	-1.628	-1.488	-1.353	-1.222	-1.093	-.967
3.650	-2.887	-2.758	-2.620	-2.475	-2.323	-2.166	-2.007	-1.849	-1.691	-1.536	-1.385	-1.237	-1.094	-.955	-.820
3.675	-2.618	-2.512	-2.400	-2.283	-2.160	-2.031	-1.896	-1.755	-1.609	-1.458	-1.306	-1.154	-1.004	-.855	-.711
3.700	-2.306	-2.209	-2.109	-2.007	-1.901	-1.793	-1.681	-1.563	-1.440	-1.313	-1.180	-1.043	-.903	-.761	-.619
3.725	-1.993	-1.900	-1.806	-1.710	-1.611	-1.510	-1.407	-1.302	-1.194	-1.084	-.970	-.853	-.733	-.610	-.484
3.750	-1.684	-1.594	-1.503	-1.410	-1.315	-1.220	-1.123	-1.025	-.926	-.825	-.721	-.615	-.507	-.396	-.283
3.775	-1.378	-1.293	-1.206	-1.117	-1.028	-.937	-.845	-.751	-.654	-.557	-.458	-.357	-.255	-.152	-.047
3.800	-1.075	-.995	-.914	-.831	-.745	-.658	-.569	-.479	-.387	-.294	-.200	-.104	-.007	.089	.187
3.825	-.765	-.692	-.616	-.539	-.459	-.378	-.295	-.211	-.126	-.039	.048	.139	.231	.324	.419
3.850	-.446	-.382	-.316	-.246	-.174	-.101	-.025	.051	.131	.212	.296	.381	.469	.558	.649
3.875	-.117	-.063	-.006	.053	.116	.182	.250	.321	.393	.468	.545	.624	.705	.788	.873
3.900	.218	.263	.311	.362	.416	.473	.532	.594	.658	.724	.793	.863	.936	1.011	1.089
3.925	.552	.591	.631	.674	.719	.766	.816	.869	.924	.981	1.041	1.103	1.169	1.237	1.308
3.950	.862	.902	.940	.979	1.019	1.060	1.103	1.147	1.194	1.243	1.294	1.349	1.406	1.467	1.531
3.975	1.123	1.175	1.220	1.263	1.303	1.342	1.380	1.419	1.460	1.502	1.546	1.593	1.643	1.696	1.751
4.000	1.311	1.388	1.453	1.509	1.557	1.599	1.639	1.677	1.714	1.752	1.792	1.832	1.875	1.920	1.967
4.050	1.380	1.530	1.665	1.781	1.879	1.962	2.032	2.092	2.145	2.191	2.232	2.270	2.307	2.345	2.384
4.100	1.158	1.345	1.529	1.706	1.873	2.027	2.165	2.286	2.387	2.471	2.542	2.603	2.657	2.705	2.750
4.150	.867	1.056	1.247	1.443	1.638	1.831	2.018	2.197	2.363	2.512	2.646	2.763	2.863	2.950	3.024
4.200	.617	.790	.970	1.159	1.355	1.554	1.753	1.953	2.150	2.343	2.529	2.705	2.867	3.013	3.142
4.250	.413	.573	.743	.923	1.111	1.303	1.498	1.695	1.895	2.099	2.304	2.506	2.704	2.895	3.076
4.300	.235	.380	.538	.710	.894	1.085	1.280	1.476	1.674	1.877	2.081	2.285	2.491	2.697	2.900
4.350	.094	.221	.364	.522	.697	.881	1.073	1.270	1.470	1.676	1.884	2.091	2.298	2.505	2.711
4.400	-.006	.100	.224	.366	.527	.702	.888	1.082	1.281	1.487	1.696	1.907	2.119	2.329	2.539
4.450	-.065	.022	.127	.250	.393	.556	.732	.919	1.113	1.316	1.524	1.735	1.948	2.162	2.376
4.500	-.087	-.013	.074	.178	.302	.448	.610	.786	.972	1.168	1.373	1.582	1.794	2.008	2.223
4.600	-.174	-.093	0.000	.108	.227	.358	.498	.647	.805	.973	1.154	1.343	1.540	1.742	1.948
4.700	-.330	-.285	-.227	-.155	-.067	.038	.164	.307	.466	.641	.829	1.026	1.230	1.435	1.640
4.800	-.395	-.378	-.354	-.321	-.278	-.221	-.149	-.061	.042	.164	.301	.456	.624	.803	.991
4.900	-.418	-.412	-.403	-.390	-.373	-.348	-.315	-.270	-.214	-.144	-.060	.041	.161	.299	.452
5.000	-.430	-.428	-.424	-.419	-.412	-.401	-.387	-.367	-.340	-.304	-.258	-.199	-.125	-.035	.072

TABLE 9
C. LOG ABUNDANCE -2.00

LOG T	LOG P														
	-2.00	-1.50	-1.00	-.50	0.00	.50	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
3.500	-5.198	-5.276	-5.327	-5.346	-5.333	-5.288	-5.204	-5.147	-5.078	-4.999	-4.909	-4.809	-4.702	-4.587	-4.465
3.525	-4.873	-4.989	-5.090	-5.169	-5.212	-5.202	-5.132	-5.075	-5.003	-4.917	-4.817	-4.704	-4.579	-4.442	-4.296
3.550	-4.502	-4.644	-4.772	-4.884	-4.971	-5.016	-5.001	-4.965	-4.911	-4.837	-4.742	-4.628	-4.494	-4.343	-4.179
3.575	-4.101	-4.265	-4.416	-4.551	-4.663	-4.739	-4.759	-4.742	-4.707	-4.654	-4.581	-4.487	-4.372	-4.234	-4.076
3.600	-3.679	-3.864	-4.035	-4.189	-4.319	-4.411	-4.444	-4.433	-4.402	-4.352	-4.284	-4.199	-4.099	-3.985	-3.857
3.625	-3.246	-3.449	-3.638	-3.810	-3.953	-4.053	-4.087	-4.075	-4.041	-3.988	-3.916	-3.831	-3.733	-3.627	-3.513
3.650	-2.810	-3.027	-3.233	-3.421	-3.579	-3.688	-3.722	-3.706	-3.669	-3.613	-3.539	-3.451	-3.354	-3.249	-3.139
3.675	-2.378	-2.606	-2.825	-3.027	-3.202	-3.324	-3.364	-3.348	-3.310	-3.252	-3.176	-3.088	-2.991	-2.887	-2.778
3.700	-1.958	-2.192	-2.419	-2.632	-2.821	-2.958	-3.012	-3.000	-2.965	-2.907	-2.833	-2.745	-2.648	-2.544	-2.436
3.725	-1.553	-1.788	-2.018	-2.238	-2.435	-2.587	-2.658	-2.654	-2.625	-2.572	-2.501	-2.416	-2.320	-2.218	-2.111
3.750	-1.175	-1.402	-1.628	-1.847	-2.047	-2.207	-2.294	-2.300	-2.279	-2.234	-2.169	-2.089	-1.998	-1.899	-1.796
3.775	-.853	-1.047	-1.257	-1.466	-1.660	-1.820	-1.917	-1.931	-1.920	-1.886	-1.831	-1.759	-1.675	-1.582	-1.484
3.800	-.649	-.762	-.923	-1.104	-1.281	-1.431	-1.528	-1.549	-1.547	-1.523	-1.479	-1.419	-1.345	-1.261	-1.171
3.825	-.571	-.603	-.676	-.791	-.927	-1.052	-1.138	-1.158	-1.161	-1.146	-1.113	-1.065	-1.003	-.931	-.851
3.850	-.553	-.551	-.555	-.578	-.634	-.705	-.759	-.773	-.774	-.762	-.736	-.698	-.648	-.589	-.521
3.875	-.550	-.541	-.522	-.489	-.453	-.431	-.422	-.415	-.403	-.384	-.358	-.325	-.284	-.235	-.180
3.900	-.552	-.543	-.522	-.475	-.391	-.281	-.173	-.126	-.082	-.042	-.004	.033	.074	.117	.165
3.925	-.553	-.546	-.529	-.485	-.395	-.245	-.050	.050	.144	.225	.294	.354	.407	.456	.504
3.950	-.554	-.549	-.536	-.501	-.420	-.269	-.040	.097	.239	.374	.494	.596	.681	.752	.810
3.975	-.549	-.550	-.542	-.515	-.449	-.314	-.088	.059	.225	.397	.567	.722	.857	.966	1.054
4.000	-.532	-.542	-.542	-.525	-.475	-.361	-.154	-.012	.154	.340	.535	.730	.914	1.074	1.209
4.050	-.512	-.513	-.516	-.516	-.499	-.433	-.286	-.172	-.031	.137	.330	.540	.760	.982	1.199
4.100	-.509	-.507	-.506	-.501	-.488	-.453	-.365	-.290	-.188	-.058	.100	.285	.491	.713	.946
4.150	-.509	-.506	-.503	-.498	-.489	-.464	-.404	-.351	-.278	-.183	-.064	.079	.249	.443	.658
4.200	-.510	-.508	-.504	-.498	-.489	-.472	-.434	-.398	-.347	-.277	-.184	-.067	.073	.237	.425
4.250	-.509	-.508	-.506	-.500	-.490	-.475	-.448	-.425	-.391	-.341	-.274	-.186	-.073	.064	.230
4.300	-.506	-.507	-.506	-.502	-.493	-.477	-.453	-.436	-.412	-.378	-.331	-.265	-.179	-.069	.067
4.350	-.478	-.488	-.496	-.499	-.495	-.482	-.456	-.439	-.418	-.392	-.357	-.310	-.245	-.161	-.051
4.400	-.469	-.469	-.470	-.475	-.480	-.479	-.462	-.445	-.424	-.398	-.366	-.327	-.277	-.211	-.125
4.450	-.468	-.468	-.467	-.466	-.464	-.461	-.451	-.441	-.425	-.402	-.372	-.335	-.289	-.233	-.163
4.500	-.467	-.467	-.466	-.466	-.464	-.461	-.451	-.442	-.428	-.406	-.376	-.337	-.290	-.236	-.172
4.600	-.463	-.463	-.462	-.462	-.462	-.461	-.458	-.455	-.451	-.443	-.430	-.408	-.376	-.329	-.265
4.700	-.457	-.457	-.457	-.457	-.457	-.457	-.456	-.455	-.454	-.451	-.448	-.441	-.430	-.413	-.385
4.800	-.454	-.454	-.454	-.454	-.453	-.453	-.453	-.452	-.452	-.451	-.450	-.448	-.445	-.439	-.430
4.900	-.453	-.453	-.453	-.452	-.452	-.452	-.451	-.451	-.451	-.451	-.450	-.449	-.448	-.447	-.444
5.000	-.457	-.456	-.456	-.456	-.455	-.455	-.454	-.454	-.454	-.454	-.453	-.453	-.452	-.451	-.450
LOG T	LOG P														
	3.20	3.40	3.60	3.80	4.00	4.20	4.40	4.60	4.80	5.00	5.20	5.40	5.60	5.80	6.00
3.500	-4.363	-4.257	-4.149	-4.037	-3.922	-3.803	-3.680	-3.552	-3.420	-3.283	-3.142	-2.998	-2.851	-2.702	-2.552
3.525	-4.174	-4.051	-3.926	-3.802	-3.678	-3.554	-3.431	-3.308	-3.183	-3.057	-2.928	-2.796	-2.662	-2.524	-2.383
3.550	-4.042	-3.901	-3.759	-3.618	-3.479	-3.342	-3.208	-3.077	-2.948	-2.821	-2.694	-2.569	-2.442	-2.315	-2.185
3.575	-3.938	-3.793	-3.644	-3.493	-3.341	-3.191	-3.043	-2.898	-2.757	-2.619	-2.485	-2.355	-2.227	-2.100	-1.975
3.600	-3.745	-3.624	-3.495	-3.358	-3.215	-3.068	-2.918	-2.768	-2.618	-2.470	-2.325	-2.184	-2.046	-1.912	-1.781
3.625	-3.417	-3.316	-3.211	-3.101	-2.986	-2.865	-2.738	-2.606	-2.470	-2.330	-2.187	-2.044	-1.901	-1.760	-1.622
3.650	-3.048	-2.954	-2.858	-2.759	-2.658	-2.555	-2.447	-2.337	-2.222	-2.104	-1.982	-1.857	-1.728	-1.596	-1.464
3.675	-2.688	-2.596	-2.503	-2.407	-2.311	-2.212	-2.113	-2.011	-1.908	-1.803	-1.696	-1.586	-1.474	-1.360	-1.243
3.700	-2.346	-2.255	-2.162	-2.069	-1.974	-1.878	-1.781	-1.683	-1.584	-1.484	-1.382	-1.280	-1.176	-1.071	-.964
3.725	-2.023	-1.933	-1.842	-1.749	-1.656	-1.561	-1.465	-1.368	-1.271	-1.173	-1.074	-.974	-.874	-.773	-.671
3.750	-1.710	-1.622	-1.533	-1.442	-1.351	-1.258	-1.165	-1.071	-.976	-.880	-.783	-.685	-.587	-.488	-.388
3.775	-1.402	-1.318	-1.232	-1.146	-1.058	-.969	-.879	-.787	-.694	-.600	-.505	-.409	-.313	-.215	-.117
3.800	-1.095	-1.016	-.936	-.854	-.770	-.686	-.599	-.512	-.423	-.333	-.241	-.148	-.055	.039	.134
3.825	-.783	-.711	-.637	-.561	-.484	-.404	-.324	-.241	-.158	-.073	.013	.101	.191	.282	.375
3.850	-.462	-.399	-.334	-.266	-.195	-.123	-.049	.026	.103	.183	.264	.347	.432	.519	.608
3.875	-.131	-.078	-.021	.037	.099	.163	.229	.297	.367	.440	.515	.591	.670	.752	.835
3.900	.206	.251	.298	.347	.400	.455	.512	.572	.634	.699	.766	.835	.907	.981	1.057
3.925	.541	.579	.619	.661	.705	.751	.800	.851	.905	.961	1.019	1.080	1.144	1.211	1.280
3.950	.851	.891	.929	.967	1.006	1.047	1.089	1.132	1.177	1.225	1.275	1.328	1.384	1.443	1.505
3.975	1.113	1.164	1.210	1.252	1.292	1.331	1.368	1.405	1.445	1.486	1.529	1.574	1.623	1.674	1.729
4.000	1.300	1.377	1.442	1.499	1.546	1.588	1.627	1.664	1.701	1.738	1.777	1.817	1.859	1.903	1.949
4.050	1.364	1.516	1.652	1.768	1.867	1.950	2.021	2.081	2.134	2.181	2.221	2.258	2.295	2.333	2.371
4.100	1.136	1.325	1.511	1.689	1.858	2.013	2.153	2.275	2.377	2.461	2.532	2.594	2.647	2.696	2.741
4.150	.842	1.032	1.226	1.423	1.620	1.814	2.003	2.185	2.351	2.502	2.637	2.754	2.856	2.943	3.018
4.200	.589	.764	.946	1.137	1.334	1.534	1.736	1.938	2.137	2.332	2.519	2.696	2.860	3.007	3.138
4.250	.380	.543	.717	.899	1.088	1.282	1.479	1.679	1.881	2.086	2.292	2.496	2.696	2.890	3.072
4.300	.197	.344	.506	.680	.867	1.060	1.258	1.457	1.658	1.862	2.067	2.273	2.481	2.690	2.896
4.350	.056	.183	.328	.488	.665	.852	1.047	1.247	1.451	1.659	1.868	2.077	2.286	2.496	2.706
4.400	-.038	.067	.191	.334	.496	.672	.860	1.056	1.258	1.466	1.677	1.890	2.104	2.318	2.532
4.450	-.092	-.005	.099	.222	.366	.528	.705	.894	1.091	1.295	1.504	1.717	1.932	2.148	2.365
4.500	-.111	-.038	.048	.153	.278	.423	.586	.763	.951	1.149	1.354	1.564	1.778	1.993	2.211
4.600	-.199	-.119	-.024	.083	.204	.336	.477	.627	.786	.955	1.136	1.326	1.524	1.727	1.935
4.700	-.353	-.310	-.253	-.182	-.095	.008	.131	.273	.431	.606	.795	.994	1.199	1.408	1.615
4.800	-.419	-.403	-.380	-.348	-.305	-.249	-.179	-.093	.008	.127	.262	.412	.577	.753	.939
4.900	-.440	-.435	-.427	-.415	-.398	-.374	-.342	-.299	-.244	-.175	-.092	.007	.123	.257	.406
5.000	-.449	-.447	-.444	-.439	-.433	-.423	-.410	-.391	-.365	-.330	-.284	-.227	-.155	-.067	.038

REFERENCES

- Allen, C. W. 1963, *Astrophysical Quantities* (2d ed.; London: Athlone).
 ———. 1973, *Astrophysical Quantities* (3d. ed.; London: Athlone).
 Ažusienis, A., and Straižys, V. 1969, *Soviet Astr.—AJ*, **13**, 316.
 Bell, R. A., Eriksson, K., Gustafsson, B., and Nordlund, Å. 1976, *Astr. Ap. Suppl.*, **23**, 37 (GBEN).
 Blanco, V. M., Demers, S., Douglass, G. G., and FitzGerald, M.P. 1970, *Pub. U.S. Naval Obs.*, Vol. 21.
 Breger, M. 1976, *Ap. J. Suppl.*, **32**, 1.
 Broadfoot, A. L. 1972, *Ap. J.*, **173**, 681.
 Buser, R. 1978, *Astr. Ap.*, **62**, 411.
 Buser, R., and Kurucz, R. L. 1978, *Astr. Ap.*, **70**, 555.
 Carbon, D. F. 1974, *Ap. J.*, **187**, 135.
 Carbon, D. F., and Gingerich, O. J. 1969, in *Theory and Observations of Normal Stellar Atmospheres*, ed. O. Gingerich (Cambridge, MA: MIT Press), p. 377.
 Code, A. D. 1975, *Dudley Obs. Rept.*, No. 9, p. 221.
 Code, A. D., Davis, J., Bless, R. C., and Hanbury Brown, R. 1976, *Ap. J.*, **203**, 417.
 Code, A. D., and Meade, M. R. 1976, *Wisconsin Ap.*, No. 30.
 Crawford, D. L., and Barnes, J. V. 1970, *A.J.*, **80**, 955.
 Gingerich, O., Noyes, R. W., Kalkofen, W., and Cuny, Y. 1971, *Solar Phys.*, **18**, 347 (HSRA).
 Gustafsson, B., Bell, R. A., Eriksson, K., and Nordlund, Å. 1975, *Astr. Ap.*, **42**, 407 (GBEN).
 Hayes, D. S. 1970, *Ap. J.*, **159**, 165.
 Hayes, D. S., and Latham, D. W. 1975, *Ap. J.*, **197**, 593.
 Hayes, D. S., Latham, D. W., and Hayes, S. H. 1975, *Ap. J.*, **197**, 587.
 Jamar, C., Macau-Hercot, D., Monfils, A., Thompson, G. I., Houziaux, L., and Wilson, R. 1976, ESA SR-27.
 Kurucz, R. L. 1970, *Smithsonian Ap. Obs. Spec. Rept.*, No. 309.
 ———. 1974, *Solar Phys.*, **34**, 17.
 Kurucz, R. L., and Peytremann, E. 1975, *Smithsonian Ap. Obs. Spec. Rept.*, No. 362.
 Kurucz, R. L., Peytremann, E., and Avrett, E. H. 1974, *Blanketed Model Atmospheres for Early-Type Stars* (Washington: Smithsonian Institution Press) (KPA).
 Labs, D., and Neckel, H. 1968, *Zs. Ap.*, **69**, 1.
 ———. 1970, *Solar Phys.*, **15**, 79.
 Matsushima, S. 1969, *Ap. J.*, **158**, 1137.
 Matthews, T., and Sandage, A. 1963, *Ap. J.*, **138**, 30.
 Mihalas, D. 1970, *Stellar Atmospheres* (San Francisco: Freeman).
 ———. 1972, NCAR Tech. Note STR-76.
 Oke, J. B., and Schild, R. 1970, *Ap. J.*, **161**, 1015.
 Peterson, D. M. 1969, *Smithsonian Ap. Obs. Spec. Rept.*, No. 293.
 ———. 1975, personal communication.
 Peytremann, E. 1970, Ph.D. thesis, Université de Genève.
 ———. 1972, *Astr. Ap.*, **17**, 76.
 ———. 1974a, *Astr. Ap.*, **33**, 203.
 ———. 1974b, *Astr. Ap. Suppl.*, **18**, 81.
 Relyea, L. J., and Kurucz, R. L. 1978, *Ap. J. Suppl.*, **37**, 45.
 Sahal-Bréchet, S., and Segré, E. 1971, *Astr. Ap.*, **13**, 161.
 Schild, R., Peterson, D. M., and Oke, J. B. 1971, *Ap. J.*, **166**, 95.
 Strom, S. E., and Kurucz, R. L. 1966, *J. Quant. Spectrosc. Rad. Transf.*, **6**, 591.
 Tapia, S. 1974, personal communication.
 Tüg, H., White, N. M., and Lockwood, G. W. 1977, *Astr. Ap.*, **61**, 679.
 Vernazza, J. E., Avrett, E. H., and Loeser, R. 1976, *Ap. J. Suppl.*, **30**, 1 (VAL).
 Vidal, C. R., Cooper, J., and Smith, E. W. 1973, *Ap. J. Suppl.*, **25**, 37.
 Withbroe, G. L. 1971, *NBS SP-353*, p. 127.

ROBERT L. KURUCZ: Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138