It was found that the incremental form of the redshift-magnitude relation provides added insight into the relationship between the incremental magnitudes obtained from observational data and possible model universes as defined by the density and acceleration parameters. In addition, the derivatives of the incremental magnitude with respect to the redshift provide conditions that are of aid in determining a model universe from observational data.

Preliminary results of a computing program using the incremental form of the redshift-magnitude relation and incremental magnitudes obtained from observational data indicate that the cosmical constant and curvature constant are positive.

Intensities of Stellar Bands from Interferometric Spectra. WILLIAM M. SINTON, *Lowell Observatory*.—Fourier-transform spectra with an interferometer have been obtained of about 50 stars at Lowell Observatory since 1962. For the most part the spectra include the region from $1.9\text{--}2.5\ \mu$ and have been obtained at Flagstaff, Arizona, with the Perkins reflector of the Ohio State and Ohio Wesleyan Universities. Some spectra have been observed out to $4\ \mu$, but the extended region does not seem to include any strong stellar bands, and emphasis has therefore been placed on the nearer spectral region. Stellar bands that have been studied are the long-wavelength wing of the $1.9\text{-}\mu$ water band, which has been found in very late giants and late supergiants, and the band heads of the 2-0 and 3-1 vibrational transitions of carbon monoxide which have been found in M giants and supergiants from K5 to M8 (Boyce, P. B., and Sinton, W. M., *Astron. J.* **69**, 534, 1963).

A variation of these bands with phase in Mira variables has been observed. It is found that while the CO bands do not vary appreciably with phase, the intensity of the H_2O bands do vary substantially and are strongest at minimum light in the star R Leo. On the other hand, in χ Cyg it is found that not only does the intensity of the H_2O band vary but the intensity of CO bands varies in a complementary relationship. Moreover, the maximum amount of water (and the minimum amount of CO) is found before minimum light. However, it is felt that more observations are needed to confirm this phenomenon.

Most carbon stars do not show the CO bands appreciably except in the case of RS Cyg (C 8,2) in which the bands are especially strong. In this star there are also absorptions which are tentatively attributed to the P branches of the 2-0, 3-1, and 4-2 transitions of the CH molecule and overlie the region from $2.0\text{--}2.3\ \mu$. These bands have not been observed in laboratory spectra, and consequently, the molecular constants are not known with high accuracy.

Overlapping of the bands lead to the difficulties in the assignment.

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Periodicities in the Jovian Decametric Radio Emission. N. F. SIX, JR., J. R. HOLMES, *Brown Engineering Co.*, G. R. LEBE, A. G. SMITH, AND T. D. CARR, *University of Florida*.—Autocorrelation and power spectrum analyses have been made of the decameter-wavelength radio emission from Jupiter received at stations in Florida and in Chile at the frequencies 15, 18, and 22.2 MHz during the apparitions of 1960, 1961, 1962, and 1963. The authenticity of the various periodic components has been decided by determining which periods appear from year to year, from frequency to frequency, and from station to station. The most dominant periods in the 21 samples analyzed are 3-4, 17-18, and 34-35 days. Periods of 7-8, 11-12, 19-20, and 24-25 days also appeared in a majority of the samples. We have attempted to find physical periods which match these, in order to perhaps uncover related phenomena. The Jovian emission is known to be correlated with (1) the system III longitude of the central meridian and (2) the position of the satellite Io. The 3.5-day syzygy period of Io and V and the 7-day syzygy period of Io, Europa, and Ganymede account for many of the periodic components in the emission. Autocorrelation studies have been performed on various solar indices to determine what periodic components exist in them besides the solar rotation period. The indices investigated were the 2800-MHz flux, sunspot number, and solar flare importance number for the years 1961-1963. Legitimate periodic components at 7-9, 10-11, and 32-35 days appear to be present.

Stellar Axial Rotation, Be Stars, and Equatorial Breakup. ARNE SLETTEBAK, *Perkins Observatory*.—Rotational velocities and spectral types were estimated for 56 emission-line stars of later B type. Of these, 42 B6-B9e stars are discussed statistically and show a frequency distribution which is consistent with the assumption that all the stars are rotating with an equatorial velocity near 350 km/sec but have their rotation axes randomly distributed in space.

The largest observed rotational velocities for stars of spectral types O9.5 to F0 are compared with computed equatorial breakup velocities for stars of corresponding spectral types. The region of minimum difference between the observed and computed velocities is approximately that occupied by the Be stars.