given frequency the three principal cones tend to be stable in position and angular width with time, (d) subsidiary cones may occasionally be observed, (e) certain phenomena are characteristic of phase with respect to the principal lobe, in particular the sense of frequency drift, and the polarization reversals and magnetic field inclination both of which are approximately aligned with the major lobe.

These phenomena are generally consistent with models such as Warwick's in which the decameter radiation is produced at the local gyrofrequency in an obliquely rotating magnetic field.

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Recent Spectroscopic Investigations of Jupiter and Saturn. HYRON SPINRAD, GUIDO MÜNCH, AND LAURENCE M. TRAFTON, *Jet Propulsion Laboratory*.—This report deals with high-dispersion spectroscopic studies currently in progress at the Mt. Wilson and Palomar Observatories. On spectra taken with the slit along Jupiter's equator we have found that the inclinations of the Jovian ammonia and methane absorption lines are less than would be expected if these gases rotate with the planet (Spinrad, *Astrophys. J.*, to be published, 1962). The result is interpreted to mean a *slow* rotation for the NH_3 and CH_4 molecules. In the case of Saturn, the CH_4 lines are inclined so that the methane appears to be rotating about 10% *faster* than the cloud layer producing the scattered Fraunhofer spectrum (Münch and Spinrad, 11th Liège Symposium, Physics of Planets, 1962).

The Jovian NH_3 lines vary in strength with time, probably on a time scale longer than a few days. From the half-widths of the Jovian NH_3 and CH_4 absorption lines we have determined crude upper limits for the total pressure in this portion of Jupiter's atmosphere. Three weak, sharp new absorption lines not associated with the methane or ammonia bands were found in the Jovian spectrum; one of these is the $S(1)$ line of H_2 in the (4,0) band. No reasonable coincidences have been established for the other two unidentified features.

On Saturn we have found both the $S(1)$ and $S(0)$ lines of molecular hydrogen in the (4,0) band. The total amount of H_2 visible is comparable to the amount above the Jovian "reflecting layer"; a rotational temperature for the H_2 has been determined. We cannot identify any of the red NH_3 lines in the Saturn spectrum with certainty. The ammonia content of Saturn's atmosphere in 1962 must be considerably below the usually quoted value of 200 cm-atm.

Continuous Absorption in the Solar Atmosphere by the Quasi H_2 Molecule. THEODORE P. STECHER, *Goddard Space Flight Center*.—An analysis of limb-darkening observations by Pierce and Waddell (Pierce, A. K., and Waddell, J. H., *Mem. Roy. Astron. Soc.* **68**, 89, 1961) demonstrated the existence of a continuous absorber in the solar atmosphere in addition to the absorption produced by H^- and H . This unknown absorber starts at 4800 and increases at shorter wavelengths. The existence of such an absorber is also suggested when model atmospheres are compared with observations.

This unknown absorber is now identified as the quasi hydrogen molecule. The transition is the $1s\sigma 2p\sigma \rightarrow 15\sigma 25\sigma$ $^3\Sigma_g^+$ and its absorption coefficient has been calculated by Erkovich (Erkovich, S. P., *Opetha i Spedtr.* **8**, 307, 1960). When H_2 is included along with H^- in the computation of k_λ for the sun, good agreement with the form of the limb darkening observations is obtained. At $\lambda 2000$ the H_2 absorption is 500 times that of H^- at $\tau_{5000}=0.13$. Since $k_\lambda(H_2)$ is proportional to the square of the neutral hydrogen density, it should allow a good determination of the gas density at each point in the photosphere. It also suggests the possibility of obtaining a good boundary temperature for the sun by means of rocket and satellite limb-darkening observations.

An Interim Interstellar Radiation Field. THEODORE P. STECHER AND JAMES E. MILLIGAN, *Goddard Space Flight Center*.—Spectrophotometric and photometric observations of early-type stars from rockets show a serious disagreement between theoretical model atmospheres and the observational results in the ultraviolet. The observations are compared with model atmospheres and used to modify the interstellar radiation field recently computed by Lambrecht and Zimmerman [Lambrecht, H., and Zimmerman, H., *Wiss. Z. Schiller U. (Sena)* **5**, 217, 1955] from model atmospheres. The ionization equilibrium and chemical abundance of the interstellar medium as effected by this modified radiation field is discussed.

Exact Solution of a Class of Nongrey Milne Problems. JOHN C. STEWART, *General Atomic Division, General Dynamics Corporation*.—The method of discrete ordinates developed in Chandrasekhar's *Radiative Transfer* can be applied to a class of idealized nongrey problems in which the absorption coefficient is separable into a function of depth times a function of frequency such that the fraction of the Planck spectrum occupied by each of the values of