The radiation appears to vary by almost 25% with the rotation of Jupiter. The intensity reaches its minimum value when the magnetic pole in the northern hemisphere, at about $\lambda^{\text{III}}=200^\circ$, lies on the central meridian. This variation is consistent with the beaming of the radiation into the plane of Jupiter's magnetic equator. The results can be combined with other measurements in order to determine the spectrum of the radiation and the physical properties of the Jovian magnetosphere.

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Secular Variations in the Radio-Frequency

Emission of OH. NANNIELOU H. DIETER, HAROLD WEAVER, AND DAVID R. W. WILLIAMS, *University of California, Berkeley*.—Observations of five sources of OH emission have been carried out over the period from mid-July to the end of October 1965, mainly at frequencies of 1667 and 1665 Mc/sec. During this period two of the sources have shown variation in intensity of some of the individual peaks within the profile.

The emission from the Orion Nebula exhibits three major peaks in the 1665 Mc/sec line. Two have remained constant and the third has increased in intensity through the period of observation by a factor of 1.5.

Another source is the southern H II region, NGC 6334, which over an angular extent of approximately $30'$ has four optical condensations. It has been observed at both 1667 and 1665 Mc/sec and has been shown to vary in intensity at both frequencies. The variation occurs independently in each of the channels of 2 kc/sec bandwidth, with a maximum total range over the three months of a factor of 10. We have found no consistent relation between the variation at 1667 and 1665 Mc/sec. Individual channels can be either in phase at the two frequencies or out of phase, or nonvariable in one and variable in the other. In addition to the variation over a period of months individual channels have been observed to vary within a period of one day.

These variations cannot be explained solely on the basis of a variation in the plane of polarization. They suggest that the mechanism for excitation of the lines is a highly unstable one.

An Experimental Method of Determining the Polarization of Celestial x Rays.

JOSEPH F. DOLAN, *Smithsonian Astrophysical Observatory*.—The Borrmann effect (the anomalous transmission of x rays through a perfect crystal) has been experimentally investigated and found to be a feasible method of determining the polarization of celestial x rays. Using a 100 cm² effective collecting area, the exposure times necessary to determine the plane

and magnitude of linear polarization in the 2–8 Å region to 1% are as follows for the sources listed:

Class 3 solar flare	0.1 sec
Class 2 solar flare	1 sec
Solar plage area	0.5–5 hour
Sco XR-1	0.7 hour
Tau XR-1	7 hour.

A New Search for Visual Aurorae on Jupiter.

GEORGE A. DULK AND JOHN A. EDDY, *University of Colorado and High Altitude Observatory*.—The nature of decametric radio emission from Jupiter and the known properties of its magnetic field suggest that energetic electrons frequently impinge on its upper atmosphere. These events, occurring at the time of decametric emission, should ionize atmospheric constituents and cause a visible recombination emission spectrum. This Jupiter auroral emission has long been suspected but never observed. Past attempts to observe the effect in hydrogen- α have mostly used filter monochromators, with bandpass 15–20 Å, or low-dispersion spectrographs. The best previous search (Smith, Rodman, and Sloan, *Astron. J.* **68**, 79, 1963) could have detected a 100 kilorayleigh aurora in H α , had one occurred in their field of view. The recent finding that Io controls much of the radio emission (Bigg, *Nature* **203**, 1008, 1964) enables one to predict the time and place of probable aurorae on Jupiter (Dulk, *Science* **148**, 1585, 1965) and thus increases the chance of detection. Auroral activity is likely to occur on magnetic field lines connecting Io to Jupiter, at times and places favorable for detection several times per week, with duration 3 to 5 h. The authors have reinitiated the optical search for these events using the coude spectrograph at the 84-in. telescope at the Kitt Peak National Observatory. Auroral emission expected is a narrow, weak perturbation in the reflected absorption lines, Doppler-shifted from line center by planetary rotation. With spectral resolution of 0.1 Å, a 1.2 kilorayleigh aurora should be detectable in H α , and approximately 10 kilorayleigh aurora elsewhere in the spectrum. Spectra were obtained on three favorable nights in November 1965 with negative results. We conclude that either no aurora brighter than 1.2 kilorayleigh was present or the spectrograph slit was incorrectly placed on the planet. Nearly concurrent filtergrams were obtained with a 5 Å H α interference filter which has a 1000 kilorayleigh auroral threshold.

Measurement of the Polarization of [Fe XIII] $\lambda 10747$ During the 30 May Eclipse. JOHN A. EDDY AND J. MCKIM MALVILLE, *High Altitude Observatory*.—Scans of $\lambda 10747$ were obtained with a 10-in. Cassegrain from the French island Bellingshausen. The polarization of the line and the neighboring con-