lengths, using the NRAO 85-foot reflector. The mean flux observed at 22 cm was about $6(10^{-26}) \text{ (wm}^{-2}) \text{ m}^{-2}(\text{c/s})^{-1}$ during the month of May, 1959. The mean flux at 68 cm on May 26 and 27, 1959, was about $13(10^{-26}) \text{ (wm}^{-2}) \text{ m}^{-2}(\text{c/s})^{-1}$. The black-body disk temperatures required to produce the observed fluxes, 3000°K. and $70,000^\circ\text{K.}$, approximately, are too high to be plausible. Flux measurements at 68 cm during the period July 20–30, 1959, have given a less certain flux density value of $5(10^{-26}) \text{ (wm}^{-2}) \text{ m}^{-2}(\text{c/s})^{-1}$. The observed fluxes are combined with the data of other observers to show that Jupiter is, in fact, emitting a non-thermal spectrum with flux proportional to λ^{+2} , approximately.

An observational search for variations in the flux is discussed. High-sensitivity monitoring of the planet at 440 mc showed no statistically significant short period variations in flux during two nights of observing. An extensive set of observations at 22 cm suggests that variations of the order of 30 per cent occur in the flux in times of the order of days. There is no statistically significant correlation between the apparent variations and planetary rotation.

It is proposed that the radiation originates as synchrotron radiation from relativistic particles trapped in the Jovian magnetic field, a situation similar to the terrestrial Van Allen belts. A Jovian field of 5 gauss and a total number of particles 10^6 times greater than in the terrestrial system will suffice to explain the observations.

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Edelson, S., Coates, R. J., Santini, N. and McCullough, T. F. *Time relations between centimeter wavelength bursts and solar $H\alpha$ flares.*

Since March 1959 the Naval Research Laboratory has been making $H\alpha$ spectroheliograms of the sun at 6-second intervals concomitantly with centimeter solar radio observations. Flare light-curves derived from these rapid-sequence films have been compared directly with the observed flux curves of the associated radio bursts. Current measurements of time differences between the $H\alpha$ maximum intensity and the 10-cm peak flux indicate that the events may be classified according to the 10-cm excitation level which exists before the flux peak.

In the first type, the 10-cm radio flux rises rapidly to a peak from the quiet sun level in

less than 2 minutes, and always precedes the $H\alpha$ maxima. In 60 per cent of the events of this class, the 10-cm burst peaks occur 2 to 10 seconds before the $H\alpha$ maxima; 35 per cent have time differences of 10 to 20 seconds; and 5 per cent lead the $H\alpha$ by 20 to 30 seconds.

In the second type, 10-cm excitation exists for more than 4 minutes before the time of burst peak flux. Five per cent of the events of this class have 10-cm peaks following the $H\alpha$ maxima by 0 to 10 seconds, while the great majority have 10-cm peaks preceding the flare maxima with the following time distribution: 30 per cent lead by 0 to 10 seconds, 35 per cent lead by 10 to 20 seconds, 25 per cent lead by 20 to 30 seconds, and 5 per cent lead by 30 to 40 seconds. There is evidence that several events of the second type may be associated with more than one source.

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Evans, John W. *Flare-associated magnetic activity in the sun.*

Observations of the longitudinal Zeeman effects in a solar active center show the variations of magnetic field strength during a period of 144 minutes on 30 April 1958, which included the development and decay of a flare of importance 1+. The measurements show that the flare crossed the neutral line of zero longitudinal field, and, although the extremities lay in regions of steep field gradients, most of the flare area was a region of low gradient. A small but pronounced S pole within the flare area developed and faded away in exact synchronism with the flare intensity. However, the large magnetic changes affected the whole field of the active center. The integrated magnetic energy of the region underwent a sharp decrease of about 16 per cent during the 14 minute rising phase of flare intensity, and an even sharper recovery to its initial value immediately after flare maximum. This behavior was shared by the large sunspot fields and the area outside the sunspots. On the assumption that the field was 5000 km deep, the energy change of the active center amounted to 4×10^{31} ergs. The $H\alpha$ radiation of the flare during its life was about 10^{28} ergs. Thus the changes in magnetic energy probably exceed the total radiation of the flare in the Balmer and Lyman series by a considerable factor.

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