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Section 6. Solar Emission and Related Terrestrial Phenomena

The observations of IPS(interplanetary scintillation) of radio sources at 69 MHz have been continued at Toyokawa, Fuji and Sugadaira. A full-automatic system of IPS observations has been completed. Observations at every station are controlled by a program timer and a time standard clock which is synchronized with radio time signal. Data acquisition is controlled by a minicomputer. Antenna multi-beams are steerable in the north-south direction as well as in the east-west direction. IPS receivers have been also renewed.

For the purpose of observing near the sun (0.1～0.3 AU), the construction of new spaced receivers at UHF(≈327 MHz) has been continued. Each of the antenna has a cylindrical parabolic reflector of 100m long (east-west direction) x 20m wide. The antenna at Toyokawa has been completed and the receiving system is being examined. The antenna at Fuji will be completed by March, 1979 and the full system at Toyokawa, Fuji and Sugadaira will be accomplished in March, 1980.

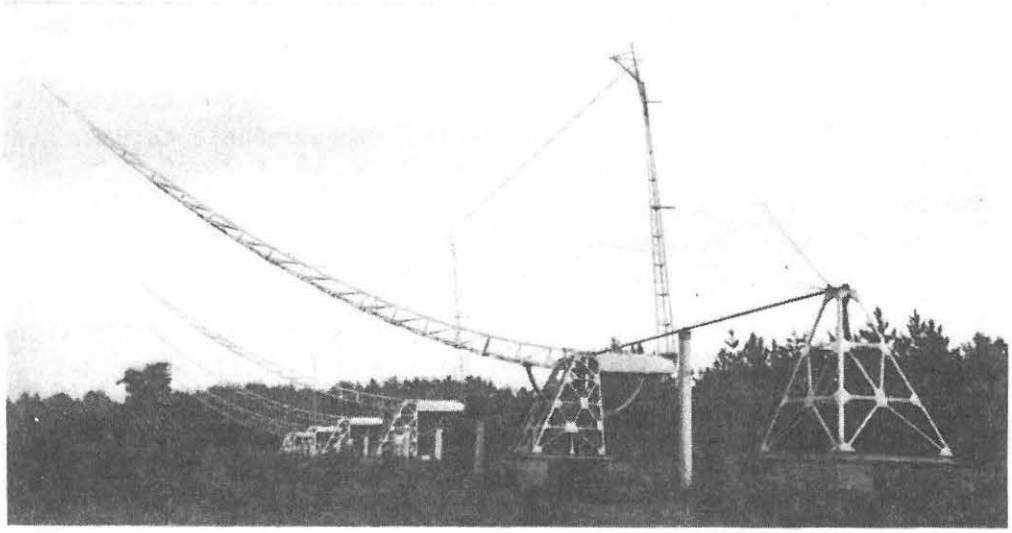

Figure 1. UHF cylindrical parabolic reflector at Toyokawa.

The three-dimensional structure of the solar wind has been discussed. The open field regions around the poles on the solar surface are assumed to extend partially to the equatorial region and the high speed solar wind is assumed to flow out of the regions. The daily values of the solar wind speed obtained by IPS observations at 69 MHz in 1974 is found to be well coincident with our model.

The mechanism of solar wind acceleration has been also considered theoretically. The solar wind is found to be accelerated up to about 800 km/s by nonstationary Alfven waves which propagate from the sun to the interplanetary space along the field lines. These waves simultaneously heat the solar wind by shaking the plasma back and forth stochastically.

The interplanetary shock waves of September and December 1977 have been studied.

Watanabe will stay in National Oceanic and Atmospheric Administration (NOAA), Boulder, U. S. A., for one year until August 1979 for study of space physics.

February 28, 1979
- H. Washimi -

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