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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, Fujigane and Sugadaira.

A new system for data acquisition to ACOS-600 computer of our Institute via public telephone lines has been completed. Quick acquisition of the data obtained at three stations becomes feasible with this system. The data processing has been carried out within the same day since November, 1977.

The phasing system for steering the antenna beam in the east-west direction which enables us to observe each sources for about one hour has been also completed.

The intensity scintillations at VHF are depressed near the sun owing to the strong scattering. For the purpose of observing IPS near the sun ( $0.1 \sim 0.3AU$ ), the construction of new spaced receivers at UHF( $\sim 327MHz$ ) has been started. Each of the antennas has cylindrical parabolic reflector of 100m long (east-west direction) x 20m wide. The antenna at Toyokawa will be completed by March, 1978 and the full system at Toyokawa, Fujigane and Sugadaira will be accomplished in March, 1980.

A latitudinal distribution of the solar wind velocity has been derived by Kakinuma by using IPS data; the solar wind velocity is 800 km/sec for latitudes above  $45^\circ$ . He has also pointed out the presence of the corotating stream which extends from this high-speed region to the equator.

Watanabe has proposed a method to estimate trajectories and deceleration characteristics for the flare-generated shock waves from IPS observations. The deceleration power-law indices have been determined for the shock waves observed in early August, 1972 and in the second STIP interval (March 15, 1976-May 15, 1976). He has also suggested that the turbulence level in the post shock plasma reaches a maximum near the high-density piston.

Kojima has refined his previous analysis of the electron density irregularities in the solar wind by using IPS data. He has found that the scintillation pattern is elongated in the direction deviated by about 9

degrees counterclockwise from the flow direction at the high heliocentric latitude.

The effect of Alfvén wave of large amplitude in the solar wind is being studied by Washimi theoretically. He has found that the ponderomotive force due to the stationary Alfvén wave makes the solar wind decelerate contrary to the current theory of the solar wind acceleration proposed by Alazraki and Couturier(1971), Belcher(1971) and Hollweg (1973). He and K. Morita have also discussed the oblique propagation of the whistler wave in an inhomogeneous magnetoplasma and derived the diffraction coefficient for the wave which had been neglected in the ray-theory.

January 27, 1978

- Haruichi Washimi -

### Publications

- Kakinuma, T.: Observations of Interplanetary Scintillation - Solar Wind Velocity Measurements, Study of Travelling Interplanetary Phenomena, (Proceedings of the L. D. de Feiter Memorial Symposium, held in Tel-Aviv, Israel, 7-10 June, 1977), edited by M. A. Shea, D. F. Smart and S. T. Wu, p.101.
- Kojima, M.: Anisotropy in the Solar Wind Plasma Irregularities Revealed by the Interplanetary Scintillation Observations, Publ. Astron. Soc. Japan, submitted.
- Washimi, H. and M. Watanabe: Magnetic Field Generation due to Ponderomotive Force in a Plasma, J. Phys. Soc. Japan, 42, 1081-1082, 1977.
- Watanabe, T.: IPS Observations of Flare-Associated Shock Waves in 1972-1974, Contributions to the Study of Travelling Interplanetary Phenomena, (Proceedings of the L. D. de Feiter Memorial Symposium, held in Tel-Aviv, Israel, 7-10 June, 1977), edited by M. A. Shea, D. F. Smart and S. T. Wu, in press.
- Watanabe, T.: IPS Observations of Flare-Generated Interplanetary Shock Waves During the Second STIP Interval (15 March-15 May 1976), Proc. Res. Inst. Atmospheric, Nagoya Univ., 25, 1978.