

Section 6. Solar Emission and Related Terrestrial Phenomena

IPS observations at a UHF frequency (327 MHz) have been continued at three stations. A larger number of IPS sources were observed in 1987 than before: 25 sources were observed in 1985, 42 sources in 1986 and 63 sources in 1987. A data book entitled "Solar Wind Speed from IPS Measurements, Feb.-Dec. 1985" has been published.

Acceleration of the solar wind at distances between 0.1 and 0.3 AU was studied with the IPS method by Kojima. The solar wind speeds were compared at distances of 0.1-0.3 AU and 0.3-1 AU. The difference in the speed of the high-speed stream averaged more than 200 km/s faster in the outer region of 0.3 AU than in the inner region. On the other hand, the speed difference was less than 100 km/s in a low speed stream. These mean that the high speed stream is still accelerated at distances of 0.1-0.3 AU.

Interplanetary shock waves associated with coronal disturbances were analyzed by means of a two-dimensional MHD simulation by Washimi. It was found that the shock wave, which originates in the open field region on the base of the corona, propagates in the interplanetary space along the boundary between the open and closed regions. This suggests that the shock triggers a slow-shock formation through Petschek-type reconnection at plasma sheet in the interplanetary space.

A numerical simulation was performed by Smith et al. for the interplanetary disturbances following a series of six solar flares in early February 1986 to explain Doppler scintillation observations of SAKIGAKE. This work focuses attention on the temporal and spatial changes in the mass flux in the region that is traversed by the telemetry signal between Earth and SAKIGAKE. Comparison of the calculated line-of-sight integration of the product, nV_{\perp} (where n is the solar wind density and V_{\perp} is the solar wind velocity component transverse to the line-of-sight), with the one-per-day interplanetary Doppler observations of SAKIGAKE was generally satisfactory.

Large-scale propagation properties of an interplanetary disturbance in association with a disappearing solar dark filament on 27 May

1979 were discussed by Watanabe et al. A kinematic model of the disturbance was determined using IPS and spacecraft observations. Strong deceleration of the propagation speed is suggested in the radial direction of the heliospheric neutral sheet.

Watanabe and Iwata compiled a data book for solar-terrestrial observations in February-March 1986. The principal data sources are solar-terrestrial observations in Japan and compiled data provided by WDC's. Data are manipulated to produce multi-parameter diagrams in several common time scales.

Washimi and Kojima participated in the XIXth General Assembly of the International Union of Geodesy and Geophysics (IUGG) held in Vancouver, Canada and the VIth International Solar Wind Conference held in Estes Park, Colorado, U.S.A. Kojima participated also in the Indo-US workshop entitled "Co-Ordinated Studies of Solar Radiations at Radio, X-ray and Optical Wavelengths and Traveling Interplanetary Phenomena During Solar Maximum Year and Beyond" held in Ahmedabad. He stayed at the Physical Research Laboratory (Ahmedabad, India) for three weeks to promote cooperative studies on interplanetary scintillation. Watanabe is in residence at the Max Planck Institute, Lindau, Germany since February, 1988 for ten months for cooperative studies of interplanetary disturbances.

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