

IPS observations of interplanetary disturbances associated with the 2003 October 28 X17 flare/CME event

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Interplanetary scintillation (IPS) measurements of the Solar-Terrestrial

Environment Laboratory (STEL), Nagoya University are used to study interplanetary (IP) consequences caused by the 2003 October 17 X17/4B flare event. Our IPS observations allow us to produce sky projection maps of solar wind velocity and density disturbance factor (so-called g-value) on daily basis. The radial distance coverage of our IPS observations is from 0.2 AU to 1 AU (The inner limit distance for the solar wind speed data is smaller than this; say 0.1 AU). Remarkable enhancements in solar wind speed (greater than 1,000km/s) and g-value (greater than 2) have been detected from IPS observations on October 29 JST (=UT-9 h), and they are considered as IP counterpart of the coronal mass ejection (CME) associated with the X17 flare. Enhanced speed and g-value data are found to be distributed broadly in the sky plane covered by our IPS observations, and this feature is consistent with the fact that this event is directed to the earth. There is a concentration of high speed and g-value data in the north-east quadrant of the sky plane. This implies that a significant amount of disturbance energy has been injected into the northern hemisphere, while the X17 flare is located in the southern hemisphere. The solar offset distance of enhanced speed and g-value data are smaller than that expected from the average Sun-Earth transit speed (~2,200km/s) of the IP shock for the X17 flare event. Therefore, we consider that these enhancements correspond to the internal structure of the CME. The enhanced g-value data appear to be closer to the sun than enhanced speed data, and the g-value data is likely to correspond to the ejected plasma from the corona in association with the X17 flare event.