

Global structure of interplanetary disturbances retrieved from the model fitting analysis of interplanetary scintillation data

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The global feature of the interplanetary counterpart of coronal mass ejections (CMEs) is little understood owing to a lack of imaging observations for the solar wind plasma. Interplanetary scintillation (IPS) measurements using a large number of radio sources allow us to produce an all-sky map of solar wind density fluctuations (so-called g-map), so that IPS is considered to have an excellent potential to shed a light on the unrevealed feature of interplanetary CMEs. Since the apparent feature of interplanetary CMEs in the g-map may be influenced significantly by the line-of-sight integration effect and the plane-of-sight projection effect, we need to remove these effects for studying their actual structure. In this study, we have performed the model fitting analysis of IPS measurements to extract three-dimensional information on the global structure of interplanetary disturbances associated with CMEs. Four interplanetary CME events including the July 14, 2000 event were analyzed here. Either a shell-shape or a toroidal shape disturbance models were used in this analysis. Using parameters obtained from this analysis, the total mass of interplanetary CMEs has been estimated for these events.