

Spatial distribution of the plasmaspheric ions estimated by assimilation of IMAGE/EUV data

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The IMAGE satellite observed EUV radiation at 30.4 nm which is scattered by helium ions in the plasmasphere. The imaging data of extreme ultra-violet (EUV) from the IMAGE satellite provides the information about the global structure of the plasmasphere. We are developing a data assimilation technique which incorporates the IMAGE/EUV data into a two-dimensional fluid model of the plasmasphere. Our approach consists of two steps. First, we estimate the initial state of the plasmasphere by the linear inversion. Second, we estimate the temporal evolution of the plasmasphere from a sequence of EUV images by using the ensemble transform Kalman filter, which is one of sequential data assimilation algorithms. By combining a sequence of EUV images and the dynamic model the plasmasphere, we estimate the spatial distribution of the plasmaspheric helium ions and the electric potential. We will show the structure of the plasmasphere for some events, which are estimated with the data assimilation technique.

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