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Estimation of temporal evolution of the plasmasphere using IMAGE/EUV data
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In order to model the dynamics of the plasmasphere, it is important to know the spatial structure of the electric potential. However, it is generally difficult to directly measure the electric potential distribution. Thus, it is a challenge to grasp the temporal evolution and the dynamics of the plasmasphere. Aiming at providing a comprehensive picture of the dynamics of the plasmasphere, we are developing a data assimilation technique which incorporates remote imaging data of extreme ultra-violet (EUV) from the IMAGE satellite into a simulation model of the plasmasphere. In this technique, an initial state of the plasmasphere is guessed via an inversion of the EUV data. The temporal evolution of the plasmasphere is then estimated by incorporating a sequence of EUV data into a numerical simulation model initiated with the guess of the initial state. This technique treats the magnetospheric electric potential distribution as unknown. The electric potential distribution thus can also be estimated in the course of the assimilation process.

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