Application of data assimilation technique for the modeling of the plasmasphere using EUV imaging data

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Extreme ultra-violet (EUV) imaging data have provided a variety of insights about the morphology and structure of the plasmasphere. In order to obtain further knowledge on the plasmasphere from EUV imaging data, we are developing a data assimilation method which offer a tool for understanding the temporal evolution and dynamics of the plasmasphere. In our method, the magnetospheric electric potential distribution is treated to be unknown, and estimated through the data assimilation. The plasmasphere ion distribution is estimated according to the estimated electric potential and the plasmasphere simulation model. We describe technical concepts of our method and demonstrate the current status.

Keywords: plasmasphere, data assimilation, numerical inversion