

Estimating the latitudinal dependence of plasmaspheric helium ion density based on data assimilation of the IMAGE/EUV data

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The latitudinal dependence of the plasma density along magnetic field lines is very important property that controls wave propagation and other physical processes. In analyzing EUV data taken from the IMAGE satellite, each EUV image only provides the information on a two-dimensional structure. Thus, it is basically difficult to resolve the latitudinal profile from a single EUV image. However, if multiple EUV images, which were taken from a different direction due to the motion of the satellite, are used, it would be possible to estimate the latitudinal profile. We have developed a data assimilation technique for estimating the temporal evolution of helium ion density distribution from a sequence of the IMAGE/EUV data. Since this data assimilation technique uses multiple EUV images, we can obtain the information on the latitudinal profile of helium ion density by combining a maximum likelihood approach. We will discuss how the latitudinal profile can be estimated and present some preliminary results.