

PEM027-P04

Room:Convention Hall

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Statistical visualization of the Earth's magnetosphere with THEMIS probe data

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In this study, we have visualized the averaged structure of Earth's magnetosphere using the magnetic field and plasma data obtained by THEMIS probes during the interval from August 2007 to October 2010. An advantage of using the THEMIS data is that they give us a clear picture of the Earth's magnetosphere including various boundaries.

This is due to the following characteristics:

(1) Five THEMIS probes cover large areas around the Earth up to $30 R_E$ (R_E : one Earth radius), and they offer large amount of data.

(2) The interval of the observations (2007-2010) is relatively short and the solar activity is low during its time period, so that we can expect that the data were obtained under uniform conditions.

First, we distributed THEMIS data on the X-Y plane with the GSM coordinate system. Then we separated the plane into the bins with $1R_E \times 1R_E$ (R_E : Earth radius) size. Finally, we calculated averaged values of the parameters such as density, temperature, three-components of velocity for ions and electrons, as well as three-components of magnetic field in each bin, and we displayed them with color code. Employing this method, we could visualize the Earth's magnetosphere which composed of the bow shock, magnetosheath, magnetopause etc.

We further discuss the following two points based on the obtained results.

(1) Comparison between our results and the results of previous models of the magnetosphere (such as Shue et al.'s model [1997], and Peredo et al.'s model [1995])

(2) Variations in the magnetospheric structures and the plasma transport to the change of the solar wind dynamic pressure change or to the occurrence of magnetic storms