

Emergence of the cold plasma at the high-latitude parts in the near-Earth plasma sheet

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It has been known that the near-Earth plasma sheet becomes cold during the northward IMF intervals.

This cold plasma is found predominantly in the near-Earth tail flanks, which implies that the cold plasma of the solar wind origin come directly into the near-Earth flanks.

However, the mechanism and path of the cold plasma transport have not been clarified.

We have analyzed the 9-years Geotail data to investigate the emergence condition of the cold plasma sheet in the near-Earth magnetotail.

We have found that the cold plasma sheet appeared not only under the prolonged northward IMF condition but also after a southward turning of the IMF that follows a prolonged northward IMF interval (which we call N2S).

There is a trend that the cold plasma in the N2S events distributes at the high-latitude parts in the near-Earth plasma sheet, which implies that cold solar wind particles come into the high-latitude parts of the near-Earth plasma sheet during the northward IMF intervals that proceeds the southward turning of the IMF.

We will discuss the transport path of the cold plasma from the solar wind into the near-Earth plasma sheet, based on the emergence condition and spatial distribution of the cold plasma sheet as well as the solar wind conditions.