



## **The statistical analysis on the magnetic holes of the earth magnetotail plasma sheet**

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The statistics on the magnetic holes of the earth magnetotail plasma sheet region by using THEMIS satellites' magnetic field data and plasma flows data for this paper, magnetic holes which produced by the flapping current sheet are not considered here. We found the time scale of the magnetic holes of the magnetotail plasma sheet region is several seconds to tens of seconds, and the spatial scale is smaller than a proton cyclotron radius local; we have also compared the sampling distribution of satellite data with the distribution of magnetic holes in the space, the results suggest the occurrence rate of magnetic holes in the magnetotail plasma sheet is less than magnetic holes in the solar wind; finally we have also counted the AE index corresponding magnetic holes, magnetic holes may have relationship with the geomagnetic activity.