

Plasmapause location under quiet geomagnetic conditions ($K_p \leq 1$): THEMIS observations

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Since the radial distance of the plasmapause is strongly controlled by geomagnetic activity, empirical plasmapause models have used geomagnetic K_p index to determine the average location of the plasmapause. In previous empirical models, the number of plasmapause crossings under quiet geomagnetic conditions is very small comparing to that under moderate geomagnetic conditions. Thus, quiet-time plasmapause locations estimated from previous models have a large uncertainty. In this study, we statistically examined the plasmapause location under quiet geomagnetic conditions ($K_p \leq 1$) using the electron density inferred from the THEMIS spacecraft potential. Two-year period (2008 and 2009) was chosen for analysis because both years were marked by extremely weak solar wind conditions. A total of 1193 plasmapause crossings were obtained when $K_p \leq 1$. We examine the average plasmapause location in radial distance and along the longitude under such quiet geomagnetic conditions. The average plasmapause location determined in our study is compared with that in previous studies.

Keywords: Plasmapause, K_p index, Geosynchronous orbit, Solar wind, Geomagnetic condition, Plasmasphere