



Magnetopause shape and location under a radial IMF: Comparison of THEMIS observations and empirical model

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In the last decade, many papers were devoted to unusual locations of the Earth's magnetopause when the solar wind flow is aligned with the interplanetary magnetic field (IMF). According to the different papers, the magnetopause acquires either a bullet-like shape or the magnetopause expands in all magnetic local times under this condition. In this study, we collect magnetopause crossings from the THEMIS spacecraft and compare them with a prediction by empirical magnetopause models using both L1 point and near-Earth solar wind monitors as model inputs. We calculate average uncertainties between observed and predicted magnetopause locations and we use long-lasting radial IMF intervals to avoid a problem of the solar wind propagation from L1 to the magnetopause. The preliminary analysis is in a general agreement with previous studies and shows that the subsolar (flank) magnetopause expands in the sunward (outward) direction in all local times. We discuss an influence of other factors such as the spacecraft orbital bias and various solar wind parameters on the magnetopause position.