



## Drivers of the magnetopause locations

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The magnetopause location is generally believed to be determined by the solar wind dynamic pressure and by the sign and a value of the interplanetary magnetic field (IMF) vertical ( $B_z$ ) component. The contribution of other parameters is usually considered to be negligible near the equatorial plane. Recent papers have shown a magnetopause expansion during intervals of a nearly radial IMF but even if this effect is considered our ability to predict the magnetopause location under steady or slowly changing upstream conditions remains rather weak. We present a statistical study based on more than 10 000 magnetopause crossings identified in the Themis data in course of the last half of the solar cycle. The observed magnetopause locations are compared with several empirical magnetopause models and sources of differences between observations and model predictions are analyzed. The analysis shows a clear effect of the solar wind speed, and an influence of the ionospheric conductivity on the subsolar magnetopause location. We discuss this finding in the light of present models.