



## **Themis: Locations of dayside bow shock and magnetopause**

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The prediction of the bow shock and magnetopause locations is a proof of our understanding of the processes governing the solar wind - magnetosphere interaction. The models describing the location of these boundaries as a function of upstream parameters are based on a statistical processing of crossings observed by a single spacecraft and (usually distant) solar wind monitor. This approach implicitly assumes that the downstream parameters are proportional to their upstream values. Nevertheless, the locations of boundaries would be a function of the internal state of the magnetosphere. It is usually expected that this state is determined by conditions in the solar wind but it can be significantly modified by loading/unloading of the magnetospheric plasma during substorms. We use Themis observations of the dayside low-latitude magnetopause and bow shock crossings and compare them with their empirical models. Differences between modeled and observed locations of both boundaries are plotted as a function of upstream parameters and parameters describing the state of the magnetosphere (geomagnetic indices, tilt angle, etc.). We use propagated ACE solar wind data as a proxy of upstream parameters but we created also a limited subset of crossings for which one Themis spacecraft serves as an upstream monitor. The plots are then used for a quantitative description of the influence of different parameters on locations of the boundaries.