



Do we already touch limits of predictability of the magnetopause location?

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The magnetopause is a principal boundary dividing the magnetic field of the solar origin from the region of a space that is occupied by the Earth's magnetic field. The shape and location of this boundary vary in a response to upstream driving as well as to the internal state of the magnetosphere. Since solar wind mass and momentum entering the magnetosphere should cross the magnetopause, the processes at this boundary were a subject of an intensive research in the course of years. One direction in these investigations is a development of models of the magnetopause shape and location and about two dozens of them were published within past four decades. The models have different ranges of validity, include one or more upstream drivers and use various functional forms to describe the magnetopause shape and its response to these drivers. However, our comparison of predictions of models with a large set of magnetopause crossings reveals that the statistical errors of all these models are comparable. We discuss the limits of the predictability of the magnetopause location connected with a determination of upstream conditions, analyze different factors that can influence the magnetopause location, and search for a way to a further improvement of the predictions.