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Spatial profiles of magnetosheath and LLBL parameters

Karel Jelinek, Zdenek Nemecek, and Jana Safrankova

Charles University, Faculty of Mathematics and Physics, Department of Surface and Plasma Science, Prague, Czech Republic (karel.jelinek@gmail.com)

The present models describing locations and shape of the magnetopause and bow shock are based usually on a statistical evaluation of magnetopause and bow shock crossings. We have developed and tested an automatic method to obtain the dayside magnetopause and bow shock positions as a function of upstream solar wind conditions. The approach of this method is (i) a suppression of a negative influence of possible bias caused by the low spacecraft apogee, (ii) decreasing of the statistical weight of multiple crossings during a short time period, and (iii) excluding of unusual crossings caused by a sudden change of solar wind parameters. Using this technique and two years of THEMIS magnetic field and plasma measurements, we identified the magnetosheath and constructed a map of magnetosheath plasma parameters normalized to the data of the solar wind monitor. We perform a study which allows us to compare the magnetosheath/LLBL profiles with results of gasdynamic and/or MHD simulations. The comparison exhibits a good agreement even on small spatial scales.