



## **Magnetopause under a strong southward IMF**

Jiri Simunek (1), Zdenek Nemecek (2), Jana Safrankova (2), Gilbert Pi (2), and Kostiantyn Grygorov (2)

(1) Institute of Atmospheric Physics, Upper Atmosphere, Prague, Czech Republic (jsim@ufa.cas.cz), (2) Charles University, Faculty of Mathematics and Physics, Prague, Czech Republic

Magnetopause processes are strongly influenced by the direction of the interplanetary magnetic field (IMF) in general and by a sign of its vertical ( $B_z$ ) component in particular. The northward pointing IMF leads to a creation of the plasma depletion layer or magnetic barrier characterized by the enhanced magnetic field and depressed plasma density just in front of the magnetopause. Reconnection of the IMF and lobe field lines behind the cusps results in a thick outer part of the low latitude boundary layer (LLBL) inbound the dayside magnetopause that is occupied by the magnetosheath-like plasma. These features are generally absent during intervals of southward IMF due to effectiveness of dayside reconnection. A presence of a magnetic barrier under the southward IMF was also reported but it was treated as a remnant of the previous northward IMF interval. However, THEMIS observations reveal that a magnetic barrier can be created even under strong southward IMF and that the structure of the boundary layer can persist for several hours. We present case studies as well as a small statistics showing that such structure of magnetopause layers is often connected with the interplanetary coronal mass ejections or magnetic clouds.