



Variations of magnetopause locations during ICMEs and MCs

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

(1) Charles University, Faculty of Mathematics and Physics, Department of Surface and Plasma Science, Czech Republic (annkasalohub@gmail.com), (2) Czech Academy of Sciences, Institute of Atmospheric Physics, Department of Space Physics, Prague, Czech Republic

Interplanetary coronal mass ejections (ICMEs) and their subset, magnetic clouds (MCs), are the most energetic and largest solar phenomena associated with the eruption of plasma and magnetic field from the Sun and they have substantial impact on the geomagnetic field. The boundary in space that separates the region dominated by Earth's magnetic field (the magnetosphere) from the surrounding solar wind is a layer/region called the magnetopause. A location and shape of the magnetopause are determined by a balance between the varying magnetospheric magnetic field and solar wind dynamic pressures. In this paper, we analyze the difference between observed magnetopause positions and those which are predicted by an empirical magnetopause model. Using the THEMIS data, we examine variations of both the location and shape of the magnetopause during ICMEs (2007–2015) and MCs (2007–2012) and compare them with standard solar wind conditions. Analyzing the results, we found systematic differences between magnetopause locations in these cases and we discuss the causes and consequences of such variations.