



Response of the magnetopause to strong solar wind events

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The solar wind carries different types of disturbances. Interaction of these discontinuities with the Earth's magnetic field leads to initial compression of the whole magnetosphere that is followed by an expansion when the upstream conditions return to their usual values. Reported speeds of these compression/expansions range from several units to several hundreds of km/s. However, the interaction of discontinuities with the magnetopause is a complicated process leading to significant distortions of the magnetopause surface and these breakdowns can propagate downstream along the flanks. The determination of a speed of the magnetopause motion is rather difficult under these conditions.

We have analyzed several significant interplanetary events during which both INTERBALL-1/MAGION-4 spacecraft were orbiting in the magnetopause vicinity. Measurements of these spacecraft are complemented with observations of all relevant spacecraft in order to determine the magnetopause reaction. We have concentrated our attention on the speed of the magnetopause motion and processes accompanying the magnetopause displacement. A preliminary analysis of available data suggests an important role of magnetic reconnection and surface waves in dynamics of a formation of magnetopause layers.