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Evolution of solar wind from L1 to the Earth

Jaroslav Urbar, Karel Jelinek, Zdenek Nemecek, and Jana Safrankova

Charles University, Faculty of Mathematics and Physics, Department of Surface and Plasma Science, Prague, Czech Republic (jaroslav.urbar@mff.cuni.cz)

Studies of the solar wind-magnetosphere interactions often rely on L1 observations that are propagated toward the Earth. The propagation techniques are based on an assumption of a negligible evolution of upstream parameters along the solar wind path. The present study uses multi-point observations in the solar wind with the motivation to check this assumption. The data measured in the L1 point by ACE and Wind are compared with observations of the spacecraft orbiting in the near-Earth space (Themis, Cluster, Geotail). A special attention is paid to the region in front of the Earth's bow shock because reflected and accelerated particles not only excite the waves of large amplitudes but they can modify mean values of quantities measured in an un-perturbed solar wind.