Title: Solar Wind Modification in the Earth Foreshock

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Abstract: The thesis presents statistical studies of the solar wind deceleration and deflection in the foreshock and its potential causes. The multi-point observations from the THEMIS mission in the foreshock are compared with a Wind solar wind monitor with motivation to estimate different factors influencing evolution of solar wind speed and its deflection. We have found a systematic deceleration of the solar wind mainly due to its proton component with a decreasing distance to the bow shock that is controlled by the compressibility and the level of magnetic field fluctuations in the ULF wave range associated with the flux of reflected and accelerated particles. We can conclude that the reflected particles excite waves of large amplitudes that decelerate the solar wind protons throughout the foreshock as well as in front of the Moon.

Keywords: Earth foreshock; reflected protons; solar wind proton velocity reconstruction; deceleration; ULF waves