Geophysical Research Abstracts,
Vol. 11, EGU2009-4505, 2009
EGU General Assembly 2009

Ionospheric storms on Mars

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Measurements made by the ASPERA-3 and MARSIS experiments on Mars Express have shown that space weather effects related to the impact of a dense and high pressure solar wind on Mars cause strong perturbations in the martian induced magnetosphere and ionosphere. The magnetic barrier formed by pile-up of the draped interplanetary magnetic field ceases to be a shield for the incoming solar wind. Large blobs of solar wind plasma penetrate to the magnetosphere and sweep out dense plasma from the ionosphere. The topside martian ionosphere becomes very fragmented consisting of intermittent cold/low energy and energized plasmas. The scavenging effect caused by the intrusions of solar wind plasma clouds enhances significantly the losses of volatile material from Mars.