



Variation of the martian ionosphere detected by Mars Express radar sounding

D. D. Morgan(1), D. A. Gurnett(1), R. Modolo(1), J. L. Fox(2), D. H. Crider(3), E. Nielsen(4), A. M. Krymskii(5), J. J. Plaut(6), G. Picardi(7)

(1) University of Iowa, Iowa City, Iowa, US, (2) Wright State University, Dayton, Ohio, US, (3) Catholic University of America, Washington, D.C., US, (4) Max Planck Institute for Solar System Studies, Katlenburg-Lindau, Germany, (6) Jet Propulsion Laboratory, Pasadena, California, US, (6) Southern Federal University, Rostov-on-Don, Russia, (7) "La Sapienza," University of Rome, Rome, Italy

The MARS Advanced Radar for Subsurface and Ionospheric Sounding (MARSIS) is a dual-mode radar sounder on board the ESA Mars Express spacecraft, in orbit about Mars since 25 December 2003. The Active Ionospheric Sounding mode was deployed in June 2005 and commissioned by mid-August 2005. Since that time we have collected about 16,000 traces that were capable of conversion to an ionospheric electron density profile. Fitting these results to a simplified ionospheric model at altitudes near the plasma density peak, we have analyzed the effect of solar activity and seasonal change on the density, altitude, and scale height of the martian ionosphere. We have also analyzed the dependence of the martian ionosphere on solar zenith angle, latitude, and local time. Finally, we present a possible effect of solar wind pressure on the martian atmospheric scale height.