Geophysical Research Abstracts, Vol. 7, 09064, 2005
SRef-ID: 1607-7962/gra/EGU05-A-09064

Sounding of the Martian ionosphere by the radio science experiment MaRS on Mars Express

M. Pätzold (1), B. Häusler (2), G.L. Tyler (3), S.W. Asmar (4), D.P. Hinson (3), R. Schaa (1), S.A. Tellmann (1)

(1) Institut für Geophysik und Meteorologie, Universität zu Köln, Cologne, Germany (paetzold@geo.uni-koeln.de)

(2) Institut für Raumfahrttechnik, Universität der Bundeswehr, München, Neubiberg, Germany

(4) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

(3) Dep. Of Electrical Engineering, Stanford University, Stanford, CA, USA

The radio science experiment MaRS on Mars Express sounded the Martian atmosphere and ionosphere during the first two occultation seasons from March to August 2004 and in December 2004. More than 100 ionospheric electron density profiles during the first occultation season and 28 profiles during the second season have been obtained. The profiles of the first season cover the early morning and the early evening from northern mid latitudes to low southern latitudes. The second season covers the early morning at southern mid latitudes and the polar night at high polar latitudes. Two carrier frequencies at X-band and S-band have been used simultaneously to derive columnar electron content which carries information on the lateral distribution of electron density. Both, the electron density and the electron content profile extend from 80 km altitude to more than 1000 km. The ionospheric peak density was typically found in altitudes between 130 km and 140 km, and signatures of the ionopause between 300 km and 400 km. The morning profiles show a definite eveolution of the ionospheric layer(s) with increasing solar elevation angle.