

## **Observations of the Martian Neutral Atmosphere with the Radio Science Experiment MaRS on Mars Express**

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The Radio Science Experiment MaRS on Mars Express is sounding the Martian atmosphere and ionosphere using the spacecraft radio signals at X-band and S-band in Earth occultation geometry. Vertical profiles of pressure, temperature and density of the neutral atmosphere can be derived with an altitude resolution of only a few hundred metres.

The elliptical orbit of Mars Express allows to examine a large range of local times and locations and can therefore be used to investigate latitudinal, diurnal and seasonal variations. The data set taken since March 2004 covers many daytime profiles, the development of the atmosphere in the early morning and during the polar night atmosphere on both hemispheres which could hardly be seen before by any other mission to this extent.

About 450 profiles have been obtained in three occultation seasons, about 62 of them in the northern polar regions (solar longitude 130°) and southern polar regions (solar longitude 271°).

This presentation will focus on these very special events which give insight into the still quite unknown temperature variations up to 40 km altitude in the extremely cold polar winter nights.

Model calculations of a Martian General Circulation Model (GCM) developed by the

Laboratoire de Météorologie Dynamique de C.N.R.S. (LMD) will be used to allow the interpretation of the observed atmospheric phenomena.

The MaRS experiment is funded by DLR under grant 50QP9909.