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Ionopause Features of the Martian ionosphere as observed by the Radio Science Experiment MaRS on Mars Express

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The ionopause of a planet is defined as the boundary between the ionosphere and the solar wind regime. It was first described for Venus as a strong decrease in electron density towards very small values. Before Mars Express, the ionopause at Mars has not been well observed. One reason is that the electron density noise of the Viking profiles was relatively high and did not drop below 500 el/cc. In general, MGS did not observe the ionopause due to orbital constraints.

The highly elliptical orbit of Mars Express allows to investigate the electron density of Mars up to an altitude of about 1000 km. Ionopause features at Mars are defined as a strong electron density gradient above 300 km altitude, tending to decrease the electron density towards the noise level.

The Radio Science Experiment MaRS on Mars Express sounded the Martian atmosphere and ionosphere during four occultation seasons starting from April 2004. So far, more than 400 vertical profiles of the ionospheric electron density could be derived covering both hemispheres and almost all local times. This presentation will show the high variability of the ionopause structures of the Martian ionosphere.