



## **The structure of the Venus neutral atmosphere from the Radio Science Experiment VeRa on Venus Express**

**S. Tellmann** (1), B. Häusler (2), M. Pätzold (1), M. Bird (3), G.L. Tyler (4)

(1) Rheinisches Institut für Umweltforschung, Abteilung Planetenforschung, Universität zu Köln, Cologne, Germany, (2) Institut für Raumfahrttechnik, Universität der Bundeswehr München, Neubiberg, Germany, (3) Argelander Institut für Astronomie, Universität Bonn, Germany, (4) Department of Electrical Engineering, Stanford University, Stanford, California, USA (silvia.tellmann@uni-koeln.de)

The Venus Express Radio Science Experiment VeRa uses one-way radio signals at X-band and S-band for the sounding of the Venus neutral atmosphere and ionosphere. An Ultrastable Oscillator (USO) provides a high quality onboard frequency reference source for this one-way radio link. Simultaneous, coherent measurements at two wavelengths allow separation of dispersive media effects from the classical Doppler shift. Electron density profiles of the ionosphere and profiles of pressure, temperature and neutral number density of the neutral atmosphere can be derived via an Abel transform with an altitude resolution of only a few hundred metres in the altitude range between about 40 and 100 km.

Three occultation seasons could be covered during the nominal mission of Venus Express resulting in a data set of about 140 profiles of the neutral atmosphere. Another three occultation seasons are planned during the extended mission. The polar orbit of Venus Express provides the opportunity to study the atmosphere at all planetocentric latitudes under varying illumination conditions. Day-night and latitudinal variations of the thermal structure, the high variability of the atmosphere above the troposphere and signal absorption effects caused by the  $\text{H}_2\text{SO}_4$  vapour can be investigated with the resulting data set.