



Radio sounding of the solar corona with Rosetta, Mars Express and Venus Express

S. Tellmann (1), M. Pätzold (1), B. Häusler (2), M. Bird (3) and the RSI-, VEX- & MEX-Team (1,2,3)

(1) Institut für Geophysik und Meteorologie, Universität zu Köln, Cologne, Germany (tellmann@geo.uni-koeln.de), (2) Institut für Raumfahrttechnik, Universität der Bundeswehr München, Munich, Germany, (3) Argelander Institut für Aeronomie, Universität Bonn, Bonn, Germany

The Radio Sounding Technique is a powerful tool to investigate the solar corona when the radio transmitter is at superior solar conjunction. The transmitted radio signals at X-band (8.4 GHz) and S-band (2.3 GHz) have to propagate through the dense plasma of the solar corona. Changes in carrier frequency and propagation delay reveal the large scale coronal structure, the electron content, density and turbulence of the plasma as a function of distance to the sun.

The Radio Science Experiment RSI on the ROSETTA spacecraft performed radio sounding of the solar corona during superior solar conjunction in April 2006 within an apparent distance of 40 solar radii to the solar disk in the plane of sky.

Mars Express in orbit about Mars went into solar conjunction in August/September 2004 and October/November 2006. The Radio Science Experiment MaRS was able to cover both solar conjunctions. A detailed investigation of CMEs passing the radio ray path will be presented.

In 2006 Venus was in superior solar conjunction at the same time as Mars. It was possible to sound the solar corona simultaneously during the same time period at two different locations in the plane of sky with the MaRS Experiment and the Radio Science Experiment VeRa on Venus Express.

Comparisons will be made with SOHO/LASCO images and other observations.