

# **Wave observations upstream of the Venus bowshock from the Venus Express magnetic field instrument**

**M. Delva** (1), T. L. Zhang (1), C.T. Russell (2) and H.Y.Wei (2)

(1) Space Research Institute, Austrian Academy of Sciences, Graz, Austria

(2) Inst. of Geophysics and Planetary Physics, UCLA, Los Angeles, USA

The magnetometer data from the Venus Express S/C are used for investigation of the different wave-types in the region upstream of the Venus bowshock. The data-rates of the magnetometer in different parts of the elliptical S/C orbit allow detection of low frequency waves ( $< 1$  Hz) as well as up to 16 Hz. in the part of the orbit below 12000 km altitude.

The foreshock region is the region upstream of the bowshock, which is magnetically connected to it, i.e. limited by the bowshock on the downstream side and by the magnetic field line tangent to the bowshock on the upstream side. In this region, waves are generated by various effects: solar wind ions are reflected at the bow shock and travel upstream along the fieldlines; also, magnetosheath ions can leak through the bowshock and move into the solar wind: these backstreaming particles spiral along the magnetic fieldlines, generating waves of different frequencies and amplitudes; some other mechanisms may also be active.

The occurrence of the wave types is studied as function of the distance from the bowshock, thus revealing the upstream structure and characterizing the spatial distribution of the ions of different origin.