



## **Plasma wave generation and transport in the environment of Mars and Venus**

Markus Fränz (1), Ezequiel Echer (2), Adriane M. Souza (2), Nikolay D. Borisov (3), and Eduard Dubinin (1)

(1) MPI fuer Sonnensystemforschung, Planeten, Göttingen, Germany (fraenz@mps.mpg.de), (2) National Institute For Space Research, Sao Jose dos Campos, Brazil, (3) Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Waves Propagation of Russian Academy of Sciences, Troitsk, Russia

The generation of waves with low frequencies (1-100 mHz) has been observed in the environment of most bodies in the solar system and well studied at Earth. These waves can be generated either upstream of the body in the solar wind by ionization of planetary exospheres or ions reflected from a bow shock or in the magnetosheath closer to the magnetic barrier. For Mars and Venus the waves may have special importance since they can contribute to the erosion of the ionopause and by that enhance atmospheric escape. While over the past years many case studies on wave phenomena observed at these planets have been published most statistical studies have been based on magnetic observations only. On the other hand the generation mechanisms and transport of these waves through the magnetosphere can only be quantified using both magnetic and particle observations. We use the long time observations of Venus Express (2006-2014) and Mars Express (2005-2016) and compare to recent observations by MAVEN to determine the predominant processes and transport parameters.