



## **Statistical Study in the mid-altitude cusp region: wave and particle data comparison using a normalized cusp crossing duration**

B. Grison (1), C.P. Escoubet (1), F. Pitout (2), N. Cornilleau-Wehrin (3), I. Dandouras (4), and E. Lucek (5)

(1) ESTEC, SRE-SM, Noordwijk, Netherlands (bgrison@rssd.esa.int), (2) Laboratoire de Planetologie, Observatoire de Grenoble, France, (3) LPP CNRS, Velizy, France, (4) CESR CNRS, Toulouse, France, (5) Imperial College, London, UK

In the mid altitude cusp region the DC magnetic field presents a diamagnetic cavity due to intense ion earthward flux coming from the magnetosheath. A strong ultra low frequency (ULF) magnetic activity is also commonly observed in this region. Most of the mid altitude cusp statistical studies have focused on the location of the cusp and its dependence and response to solar wind, interplanetary magnetic field, dipole tilt angle parameters.

In our study we use the database build by Pitout et al. (2006) in order to study the link of wave power in the ULF range (0.35-10Hz) measured by STAFF SC instrument with the ion plasma properties as measured by CIS (and CODIF) instrument as well as the diamagnetic cavity in the mid-altitude cusp region with FGM data. To compare the different crossings we don't use the cusp position and dynamics but we use a normalized cusp crossing duration that permits to easily average the properties over a large number of crossings. As usual in the cusp, it is particularly relevant to sort the crossings by the corresponding interplanetary magnetic field (IMF) orientation in order to analyse the results. In particular we try to find out what is the most relevant parameter to link the strong wave activity with. The global statistic confirms previous single case observations that have noticed a simultaneity between ion injections and wave activity enhancements. We will also present results concerning other ion parameters and the diamagnetic cavity observed in the mid altitude cusp region.