



Plasma waves observed in the high altitude cusp region by Cluster: an overview of three years of data

N. Cornilleau-Wehrlin (1), E. Budnick(2), A. Fedorov(2), B. Lavraud(2), B. Grison (1), P. Canu (1), M. André (3), P. Décréau (4), M. Maksimovic (5)

(1) CESTP-IPSL , (2) CESR-CNRS, (3) IRF-U, (4) LPCE-CNRS, (5) LESIA Meudon Observatory <Contact: nicole.cornilleau@cetp.ipsl.fr/ Fax: +33-1-39-25-48-98

The cusp regions of the Earth's magnetosphere are possible direct entry regions for solar wind plasma into the magnetosphere. The high latitude cusps have been very few visited before Cluster mission; it is why the study of physical processes occurring in these regions constitute one of the Cluster prime objectives. One of the question is the role of waves in the dynamics of particles in the cusp. While different case studies have already been undertaken in the aim to establish what are the different wave modes present and what are their interactions with the particles, we present here the results of the systematic analysis of the occurrence and intensity of magnetic and electric components of the different waves present in the high altitude cusp. We use the different wave prime parameter data in different frequency bands covering the 1 Hz - 80 kHz frequency range and plot their intensity on the part of orbits that have been identified to contain cusp crossings, and this for three years of data. The method is similar to the one used by Lavraud et al., (2004) for ion plasma parameters in the high latitude cusp using the CIS experiment. Comparison between the different kind of waves, as characterised by their electrostatic or electromagnetic nature and their frequency range will be presented. This identification will be supported by some example of case study. The influence of the direction of the interplanetary magnetic field on the region of maximum intensity of the waves will be discussed, in term of possible link with a reconnection site. Wave results will be compared with ion results, in particular with the density study.