



## **Density and magnetic field structure in the plasmasphere: comparison between CLUSTER data and models**

F. Darrouzet (1), J. De Keyser (1), P. M. E. Décréau (2), D. L. Gallagher (3), M. W. Dunlop (4), J. F. Lemaire (5), and M. Roth (1)

(1) Belgian Institute for Space Aeronomy (IASB-BIRA) 3, Avenue Circulaire, 1180 Brussels, Belgium (Fabien.Darrouzet@oma.be;Johan.DeKeyser@oma.be;Michel.Roth@oma.be) (2) Laboratoire de Physique et Chimie de l'Environnement (LPCE/CNRS) 3A, Avenue de la Recherche Scientifique, 45071 Orléans Cedex 2, France (Pierrette.Decreau@cnrs-orleans.fr) (3) NASA Marshall Space Flight Center (MSFC) 320 Sparkman Drive, AL 35805 Huntsville, USA (Dennis.L.Gallagher@nasa.gov) (4) Rutherford Appleton Laboratory (RAL) Chilton, Didcot, Oxon, OX11 0QX, United Kingdom (m.w.dunlop@rl.ac.uk) (5) Institut d'Astronomie et de Géophysique Georges Lemaître, Université Catholique de Louvain (UCL-ASTR) 2, Chemin du Cyclotron, 1348 Louvain-la-Neuve, Belgium (jfl@astr.ucl.ac.be)

The CLUSTER mission allows to study the plasmasphere with four-point measurements, and in particular its overall density and magnetic field distribution. The purpose of this paper is to examine the geometry and orientation of the overall density structure and of the global magnetic field. We present several CLUSTER plasmasphere crossings for which we compute the four-point spatial gradient of the electron density (WHISPER data) and the magnetic field strength (FGM data), and we compare the direction of both gradients with the local field vector. We compare our CLUSTER results with models of the density and of the magnetic field inside the plasmasphere. We discuss in particular the density and magnetic field distribution along and transverse to field lines, and introduce some comments on flux tube refilling.