

Spatial gradients in the plasmasphere: comparison between CLUSTER data and models

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The CLUSTER mission allows to study the plasmasphere with four-point measurements, including its overall density and magnetic field distribution, but also the irregularities inside the plasmasphere. The purpose of this paper is to examine the geometry and orientation of the overall density structure and of the magnetic field. We present a typical CLUSTER plasmasphere crossing for which we compute the four-point spatial gradient of the electron density and the magnetic field strength, and we compare the direction of both gradients with the local field vector. We compare also our results based on scientific data, with models of the density and the magnetic field inside the plasmasphere. We discuss in particular the role of the gradient components along and transverse to field lines, and introduce some comments on flux tube refilling.