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Spatial gradients in the plasmasphere from CLUSTER

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The CLUSTER mission allows to study the plasmasphere with four-point measurements, including its overall density distribution, plasmaspheric plumes close to the plasmapause, and density 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 discuss the role of the gradient components along and transverse to field lines; transverse density gradients, in particular, are found to point to the presence of azimuthal density variations.