



Modeling the new structures discovered in the plasmasphere

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New structures like plumes, notches, shoulders and channels were recently discovered in the plasmasphere with the observations of the satellite IMAGE. Indeed, this spacecraft provided the first global comprehensive images of the Earth's plasmasphere by the EUV (Extreme UltraViolet) instrument, revealing the large-scale dynamics of the plasmasphere and its interactions with other particle populations. The four satellites of CLUSTER have also revealed new density structures and observations of plumes. These new observations give an exceptional opportunity to check the mechanisms proposed for formation of the plasmopause and of the plumes. Some tentative explanations and possible mechanisms proposed for the formation of the structures will be presented. In particular, I will compare the satellite observations of the plasmasphere and the results of the dynamical simulations that have been developed at the Belgian Institute for Space Aeronomy to simulate the deformation of the plasmasphere during geomagnetic substorms and other variations in the level of geomagnetic activity.