



In-situ observations of electromagnetic fields and waves in the inner magnetosphere

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A large number of physical processes takes place in the inner magnetosphere, particularly on the dusk sector where plasmaspheric plumes are manifestations of the plasmaspheric erosion processes and can influence on the dynamics of both the magnetosphere and ionosphere. To gain new knowledge of these processes one needs to have multi-point measurements and particularly those of electromagnetic fields and waves that give hint of the nature of the physical processes. In this presentation we will focus on the observations of the four Cluster spacecraft that allow to distinguish temporal and spatial variations of electric/magnetic fields and waves and plasma density. The density variations are easily detected as sudden changes of spacecraft potential and plenty of density structures of varying spatial scales (up to a few L shells) can be seen especially in the dusk sector. The dc electric field observations are used to determine the drift motion of charged particles around these structures. In addition some of these structures tend to support enhanced wave activity at 100-1000 Hz in a consistent manner which can affect the drift of energetic particles and be responsible for electron loss from the radiation belts.