



The polar cusp as a radio source- results from Cluster and Demeter satellites

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The emissions with extremely high intensity around electron cyclotron frequency have been sometimes registered by satellite Magion 4 - companion of Interball 1. These waves correlate with strong fluxes of high energetic electrons often observed within the polar cusp by Interball 1 and Magion 4 as well as by Polar satellites. Multipoint measurements done by Cluster satellites give new insight of these emissions. Taking into account the plasma and magnetic field parameters in the polar cusp as well as geometry of the waves propagation, one has found that one type of these emissions can be generated by so called “fan instability” (FI), but as a source of the emissions around electron cyclotron frequency the „horse shoe” instability has been also discussed. Beam instability and interaction of Langmuir waves with energetic electrons give the broad band emissions around plasma frequency, which can be discussed as Langmuir turbulence (LT). Kilometric radiation (KR) typical for auroral zone is observed in the vicinity of the cusp’s boundary and is associated with fluxes of electrons with energy up to 100keV. Both instabilities play important role in the nonlinear wave –particle interactions leading to the isotropisation of the fluxes of the particles and heating of the plasma. The wave spectra taken by DEMETER satellite in the polar cusp at the ionospheric level are given for comparison.