



## **Which instability in the polar cusp-relation to observations by Cluster**

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Interball 1 sometimes registered in the polar cusp emissions with extremely high intensity below the electron cyclotron frequency. 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. Cluster measurements give new insight of these emissions. The observations of the waves at the frequencies close to electron cyclotron frequency done by Cluster satellites associated with strong fluxes of energetic electrons will be presented. 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 these emissions can be generated by so called “fan instability”, but also horse shoe instability can be discussed. 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.