



Quantitative relationship between BB-ELF emissions, ion heating, and density cavitation in the Cusp/Cleft

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The cusp/cleft is a turbulent region where different plasmas and the magnetic fields are interacting and producing bursty electrostatic and electromagnetic waves. Observations from within the cusp show that the particles and intense waves are dynamically coupled and can give information on the energy transport and dissipation. Papers from several missions have demonstrated that BB-ELF waves represent a spatial turbulence of dispersive Alfvén waves with short perpendicular wavelengths. We will present our Polar perigee observations at 1 Re with data analysis and modeling describing the quantitative correlation between these wave fluctuations with the enhancement in the plasma temperature and density cavitation. Through our analysis of data and numerical modeling we seek to determine if the observed relationship between the wave fluctuations with the ion heating and density cavitation can be explained either due to stochastic acceleration or due to heating in electrostatic waves generated by ion drifts in the Alfvénic electromagnetic wave.