

Multi-scale analysis of turbulence in the Earth's Plasma sheet

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During the last decade significant progress has been made in understanding MHD turbulence in the Earth's plasma sheet. The four point measurements available from the Cluster mission enable spatiotemporal effects in data sets to be resolved. One application of these multipoint measurements is the determination of the wave vectors and hence the identification of wave modes that exist within the plasma. Fourier and wavelet analysis is used to describe the spectral index and scaling indices of the turbulence for different frequency regions. We study the characteristics and properties the wave and the relationship with reconnection. It is shown that there is clear evidence for existence of strong cross-scale coupling during rapid plasma flows and reconnection. The role of waves and turbulence in the dynamics of plasma sheet will be discussed and compared with computer simulations.