



Low Frequency Nonlinear Saturnian Foreshock Waves, Generation and Dissipation Mechanisms: Cassini

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We present results of our analyses of Cassini Saturn foreshock waves using high resolution magnetometer data. Using minimum variance, wavelet and FFT analyses, long period wave properties in the spacecraft frame are identified. Periods of 4 to 20 min (wave interval 1) and 50 s to 5 min (wave interval 2) are two distinct frequency ranges noted in the data analyzed to date. From the wave direction of propagation and polarization, the wave-generating particle species and energies will be derived. Energetic particle measurements observed to accompany such waves (Sarris et al, 2005), will be used to test the veracity and accuracy of the predictions which are based on the assumption of linear cyclotron resonant interactions. The waves are often found to be phase steepened/compressive. Decompressive structures have also been noted. Association with higher frequency ELF/VLF plasma waves and possible evidence of in situ plasma heating will be studied to determine low frequency wave dissipation mechanisms.

Sarris et al., Energetic ions upstream from the saturnian magnetosphere: Cassini/MIMI observations, EGU (Vienna), 2005.