

GENERATION OF WIDEBAND WAVE SPECTRA IN THE FRONT OF HIGH MACH NUMBER QUASIPERPENDICULAR SHOCKS

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Intense wideband wave activity in the vicinity of ramp region of quasiperpendicular collisionless shock is often observed onboard satellites. The wave intensity increases immediately after the shock front and the spectrum extends to frequencies sufficiently higher than ion plasma or electron gyrofrequency. We propose transition radiation mechanism to provide a theoretical explanation for the generation of this localized wave activity. We show that intense electron flux crossing the shock transition region can result in generation of the surface waves in the frequency band lower than electron plasma frequency and propagating electromagnetic waves in the frequency range higher than electron plasma frequency. Typical wave spectra observed onboard Cluster satellites using Whisper instrument are shown to support the mechanism proposed.