



Hiss and chorus emissions: loss and source mechanisms for energetic particles

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Recent results show that whistler-mode chorus can play a significant role in the process of local acceleration of electrons in the outer Van Allen radiation belt. Using data of the four spacecraft of the Cluster mission we analyze measurements of waves and particles to characterize the role of wave-particle interactions connected to intense chorus and hiss emissions in the equatorial region of the inner magnetosphere. We use a database containing five years of systematic measurements to develop an empirical model of the properties of whistler-mode emissions. A range of wave frequencies around one-half of the equatorial electron cyclotron frequency is investigated and resonant energies of wave-particle interactions are analyzed. The wave intensity, polarization and propagation properties are organized as a function of frequency, position and level of geomagnetic activity and compared to particle measurements.