

INVESTIGATION OF PARAMETERS OF CHORUS WAVE PACKETS MEASURED BY THE CLUSTER SPACECRAFT

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Chorus emissions are generated by a nonlinear mechanism involving wave-particle interaction with energetic electrons. Discrete chorus wave packets are narrow-band tones usually rising in frequency. Measurements of the Cluster spacecraft lead to the discovery of strong temporal and spatial variations of the amplitude in the source region. We investigate amplitudes and frequency sweep rates of chorus wave packets measured by the WBD instrument onboard Cluster. These parameters are related to the total electron density measured by the WHISPER active sounder. We compare the Cluster measurements with estimates based on the backward wave oscillator (BWO) model. Both show an increasing frequency sweep rate with the decreasing cold plasma density.

Furthermore, investigations of chorus amplitudes and frequency sweep rates allow us to experimentally obtain important parameters of the BWO theory.

chorus

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