

# On the generation of totem pole emissions

Brinca, A. L.

Romeiras, F. J.

Gomberoff, L.

Marçal, M. H.

Understanding of the generation of electron cyclotron harmonic waves by almost monoenergetic perpendicular ion beams contributes to the interpretation of the totem pole (TP) emissions observed at the Earth's magnetopause by Geotail and not fully explained by the standard model invoked for the stimulation of magnetospheric electron Bernstein modes. This study uses parameters for the background medium arising from particle and field measurements concurrent with the TP observations and adopts free energy sources that have been recently observed by Interball-1. Through application of exact criteria, the stability analysis discriminates between convective and absolute (nonconvective) instabilities and shows that the latter can occur in spectral bands both below and, in contrast to the situation encountered in the standard paradigm, above the upper hybrid frequency, covering the spectrum of harmonic bands detected in the TP emissions. Copyright 2004 by the American Geophysical Union.