



Ray tracing study of rising tone EMIC-triggered emissions

Miroslav Hanzelka (1,2), Ondřej Santolík (2), Benjamin Grison (2), and Nicole Cornilleau-Wehrin (3)

(1) Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic, (2) Department of Space Physics, Institute of Atmospheric Physics, CAS, Prague, Czech Republic, (3) Laboratoire de Physique des Plasmas, CNRS/Ecole Polytechnique/Obs. de Paris/UPMC/Univ. Paris-Sud, Palaiseau, France

ElectroMagnetic Ion Cyclotron (EMIC) triggered emissions have been subject of extensive theoretical and experimental research in last years. These emissions are characterized by high coherence values and a frequency range of 0.5 - 2.0 Hz, close to local helium gyrofrequency. We perform ray tracing case studies of rising tone EMIC-triggered emissions observed by the Cluster spacecraft in both nightside and dayside regions off the equatorial plane. By comparison of simulated and measured wave properties, namely wave vector orientation, group velocity, dispersion and ellipticity of polarization, we determine possible source locations. Diffusive equilibrium density model and other, semi-empirical models are used with ion composition inferred from cross-over frequencies. Ray tracing simulations are done in cold plasma approximation with inclusion of Landau and cyclotron damping. Various widths, locations and profiles of plasmopause are tested.