

Sub-packet structures in the EMIC triggered emission observed by the THEMIS probes

NAKAMURA, Satoko^{1*}; OMURA, Yoshiharu²; SHOJI, Masafumi³; NOSE, Masahito⁴

¹Department of Geophysics, Graduate School of Science, Kyoto University, ²Reserach Institute for Sustainable Humanosphere, Kyoto University, ³Solar-Terrestrial Environment Laboratory, Nagoya University, ⁴Graduate School of Science, Kyoto University

We analyse Electromagnetic Ion Cyclotron (EMIC) triggered emission by the data from the THEMIS probes. These phenomena have recently received much attention because of the possibility of their strong interaction with energetic particles in the inner magnetosphere in spite of their scarceness in observations[1,2,3]. For 1400-1445 UT on 9 September 2010, THEMIS A, D and E observed strong EMIC waves with rising tone emissions. The probes were located near the dayside magnetopause at 8 R_E of the radial distance from the Earth, 13 MLT, and a few degrees of the geomagnetic latitude. During this time interval, the geomagnetic field was very distorted by the variation in the solar wind. We assume these emissions were excited around minimum-B pockets in accordance with the magnetospheric compression. It is found the rising tone emissions comprise of some smaller rising tones, which are called "sub-packet structures"[4]. We compare these observed sub-packet structures with the nonlinear wave growth theory developed by Omura et al. [5]. The observed relationship between the amplitudes and frequencies of the emissions are well explained by the theory, and it is also found that the threshold and optimum amplitudes for the nonlinear growth agree well with the observed dynamic spectra.

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