Properties of Intense Component of Terrestrial Hectometric Radiation Observed by Akebono (EXOS-D) Satellite

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In the spectra of THR, intense discrete components have been found in two frequency bands, from 1.3MHz to 2.1MHz (1.7MHz band) and from 2.6MHz to 4.2MHz (3.4MHz band) in the period of large magnetic storms. These two frequency band emissions are observed mainly in the trough region where plasma frequency is smaller than local electron cyclotron frequency, in a magnetic local time range from 15h to 3h . The origin of 1.7MHz band emission can be attributed to the linear mode conversion process while the generation process of 3.4MHz band emission includes non-linear processes in the mode conversion from electrostatic plasma waves into electromagnetic waves.

By PWS onboard the Akebono (EXOS-D) satellite, it has been identified that THR is one of the typical non-thermal radio emissions from the earth covering the frequency range from 1.0MHz to 5.5MHz. In the spectra of THR, intense discrete components have been found in two frequency bands, from 1.3MHz to 2.1MHz (1.7MHz band) and from 2.6MHz to 4.2MHz (3.4MHz band) in the period of large magnetic storms. These two frequency band emissions are observed mainly in the trough region where plasma frequency is smaller than local electron cyclotron frequency, in a magnetic local time range from 15h to 3h . The origin of 1.7MHz band emission can be attributed to the linear mode conversion process while the generation process of 3.4MHz band emission includes non-linear processes in the mode conversion from electrostatic plasma waves into electromagnetic waves.