

MONOCHROMATIC ULF WAVE BURST AS A SIGNATURE OF ION TEMPERATURE ANISOTROPY IN THE CUSP REGION

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In spring 2002, Cluster spacecraft were in a close configuration in the cusp region. We present the Cluster data analysis of an intense burst of electromagnetic activity at a frequency of 0.7 fci in the cusp region of the terrestrial magnetosphere. This peak is detected in a period of upgoing ion flows. The ULF wave activity level accompanying such ion flows is usually much lower than the observed one. After a simulation of wave destabilization under the local plasma parameters and the computation of the wave vector, the ion temperature anisotropy is shown to be the cause of the local wave amplification. Using a model of the magnetic field line, it is worth noticing that the DC magnetic field varies quickly enough below the spacecraft to damp the upgoing electromagnetic waves. Conversely its variation is smooth enough above the spacecraft to explain the wave amplification and the monochromatic aspect of the peak at the observed frequency. Hence we can estimate a lower limit of the temperature anisotropy duration which is in good accordance with the last IMF orientation change. We can thus use the ULF wave as a signature of an ion temperature anisotropy.

Wave-particle interaction, magnetosphere, cusp

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