

## Heating of Cold Ions by Emic Waves Using MMS Observations

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**Abstract :** The EMIC waves whose frequency ranges from 0.001 Hz to 5 Hz in the Earth's magnetosphere and have received considerable attention for energy transport across the magnetosphere. Since these waves act as a mechanism for the loss of energetic electrons from the Van Allen radiation belts to the atmosphere, therefore, it is necessary to understand how and where they can be produced, as well as the direction of waves along the magnetic field lines. In this letter, the excitation of the EMIC waves is studied by taking into account the hot proton temperature anisotropy having energy ranging from 7 KeV to 26 KeV with a minimum resonant energy of 6.9KeV. However, the opposite effect can be observed for the hot protons for energy less than the minimum resonant energy. It is revealed that as long as the intensity of the EMIC waves increases, the number density and temperature anisotropy of the protons also increase within the energy range from 1eV to 100 eV.

**Keywords :** EMIC waves, temperature anisotropy of hot protons, energization of the cold proton, magnetospheric multiscale (MMS) satellite observations

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