



Large-amplitude Electromagnetic Ion Cyclotron Wave in the Flank of the Earth's Magnetosheath

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Here we present the MMS observation of large-amplitude electromagnetic ion cyclotron (EMIC) wave events in both dusk- and dawn-side flank of the magnetosheath. In a long-lasting event, the wave amplitude is around 0.2 nT in the ambient magnetic field near 12 nT, and the characteristic frequency and scale approximate 0.2 Hz and 1028 km. We also show that the density fluctuations exhibit not anti-correlation but positive-correlation to the parallel magnetic field. By use of the fitted plasma parameters in our event, the plasma kinetic theory predicts the excitation of the EMIC and mirror instability, which can provide the energy of the observed EMIC waves and density fluctuations. Moreover, these large-amplitude EMIC waves result in a periodic variation of the pitch angle of the ions. The electron pitch angle exhibits a localized feature with a timescale approximating to the wave period. These results illustrate a close relation of the large-amplitude EMIC waves with the dynamics of charged particles.