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A case study on the plasma-to-fields energy conversion process at dipolarization front

Lei Wang (1,2), Xin Cao (1), and Aimin Du (1)

(1) Institute of Geology and Geophysics,Chinese Academy of Sciences, Key Laboratory of Earth and Planetary Physics, China (wlei@mail.iggcas.ac.cn), (2) University of Chinese Academy of Sciences

Using high-resolution data from the Magnetospheric Multiscale (MMS) mission, we investigate a dipolarization front (DF) event in the near-Earth magnetotail plasma sheet. We shows that this DF is an energy conversion process of particle-to-fields through studying energy conversion in the electron rest frame, and the time partial differential of electricmagnetic energy. We analyze in detail the terms in the general Ohm's law, and conclude that the electron pressure divergence term is a dominant contributor to balance the electric field in the electron rest frame and to undertake the process of energy conversion. We also investigate the relative contribution of ions and electrons to energy conversion in the Dehoffmann-Teller frame within the dipolarization front, and suggest that the energy transfer is dominated by ion current.