

On the kinetic nature of Dipolarization fronts

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A non-ideal MHD model including Hall and finite Larmor radius (FLR) effects was used to reproduce the dipolarization fronts (DFs) produced by the interchange instability in the magnetotail. Numerical results indicate that Hall effect on the scale of inertial length determines the distributions of electric field and its ingredients at DFs. The inclusion of FLR effect would cause a clear asymmetry and downward drifting of the DF structure, which is attributed to the ion diamagnetic velocity. In addition, it also causes to alter the direction of the high-speed flow nearby the DF.

Keywords: dipolarization fronts, interchange instability, Hall effect, FLR effect, simulation