



Sub-ion magnetic hole in depolarized magnetotail: evidences of the electron energization

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We consider a sub-ion scale magnetic holes observed by THEMIS in the near-Earth depolarized magnetotail. Using the statistics of THEMIS observations, we have demonstrated that series of magnetic holes usually occur behind the dipolarization front (rapid increase of the GSM B_z field) around the equatorial plane (GSM $|B_x| < B_z$). Holes are characterized by intense electron currents flowing along hole boundaries and carried by hot electrons. These electron population has transverse (relative to the background magnetic field) temperature much larger than the field-aligned temperature. We proposed scenario describing a formation of this hot anisotropic electron population. The scenario consists of models of electron anisotropic heating at the dipolarization front and generation of electron currents due to diamagnetic and curvature drifts of anisotropic particles. Main conclusions of the proposed models are in good agreement with the THEMIS observations.