

PEM027-03

Room: Function Room B

Time: May 24 14:15-14:30

Large electric fields at the nightside plasmopause observed by the Polar spacecraft

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We report the observation of large amplitude electric fields when the Polar spacecraft passed the plasmopause, which is identified as a boundary between cold (plasmosphere) and hot (plasma sheet) plasmas, near the midnight. These electric fields were observed during the substorm recovery phase. They are predominantly perpendicular to the ambient magnetic field and accompanied by a negative-then-positive magnetic field perturbation. That is, the magnetic field is reduced outside the plasmopause and enhanced inside the plasmopause. The field variations are dominant in the radial components (B_x and B_z) rather than the azimuthal component (B_y). It may be due to the dawnward plasmopause current, which is caused by the balance of forces at the plasmopause, perpendicular to the magnetic field. The large electric fields localized near the plasmopause may be due to the interaction between cold plasmosphere and hot plasma sheet.

Keywords: electric field, magnetic field, plasmopause, plasmosphere, plasma sheet