

# THE CUSP FROM HIGH TO LOW ALTITUDES

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The polar cusps have traditionally been described as narrow funnel-shaped regions of magnetospheric magnetic field lines directly connected to magnetosheath, allowing the magnetosheath plasma to precipitate into the ionosphere. However, recent observations and theoretical considerations revealed that the formation of the cusp cannot be treated separately from the processes along the whole dayside magnetopause and that the plasma in regions like cleft or LLBL is of the same origin. Our analysis of statistical results as well as numerous case studies identified the anti-parallel merging at the magnetopause as the principal source of the magnetosheath plasma in all altitudes. We would like to show that this fact has several important consequences: (1) one reconnection site at the magnetopause and one low-altitude cusp located around the local noon is an exclusive feature of the purely southward oriented IMF; (2) purely northward oriented IMF leads to two reconnection spots at the magnetopause but one cusp near a local noon is observed in low altitudes; and (3) the presence of a finite IMF  $B_Y$  splits the low-altitude cusp into two channels that are supplied from opposite hemispheres and located at morning and afternoon sectors of the auroral oval.