



## **Exploration of tangential discontinuity structure of the dawn and dusk flank magnetopause**

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This contribution explores the tangential discontinuity configurations that are possible at the dawn and dusk flank magnetopause. The motivation for this study is the recent finding that the magnetopause current layer seems to be on average slightly thicker at the dawn flank than at dusk. The study is carried out by considering typical magnetosheath and magnetospheric plasma properties adjacent to the magnetopause and finding out which internal magnetopause structure is compatible with the given properties, if any. This is done by repeatedly running a kinetic model that self-consistently computes the internal structure of the tangential discontinuity magnetopause. The conclusions of this study support the viewpoint that, apart from dawn-dusk differences in the magnetosheath and/or magnetospheric conditions, one also has to consider an intrinsic asymmetry. For low magnetic shear in particular, the  $v \times B$  electric field, with  $v$  the magnetosheath flow and  $B$  the geomagnetic field, points outward at dawn and inward at dusk. This convection electric field combines with the Chapman-Ferraro electric field that stems from the charge separation between the ions and electrons inside the magnetopause. Due to their different gyroradii, ions and electrons respond differently to a change of sign of the convection electric field, thus leading to dawn-dusk asymmetry of the internal structure of the magnetopause.