

A New Challenge of Storm Study: Revisiting the Partial Ring Current Model

- Dawn-dusk asymmetry of midlatitude magnetic (B) depression characterizes the main (development) phase of geomagnetic storms, which used to be explained by the duskside enhancement of the ring current, the partial ring current (PRC).
- The present study, however, found that the asymmetry is correlated with the dawnside westward auroral electrojet (AEJ), which is considered to be a part of the dawnside wedge current system.
- Figure shows that B depressions on both duskside and dawnside (ΔSMR18 & ΔSMR06) are correlated with the dawnside westward AEJ (SML06), but not with the duskside eastward AEJ (SMU18).
- The formation of the dawnside current wedge system is a new challenge of storm study.

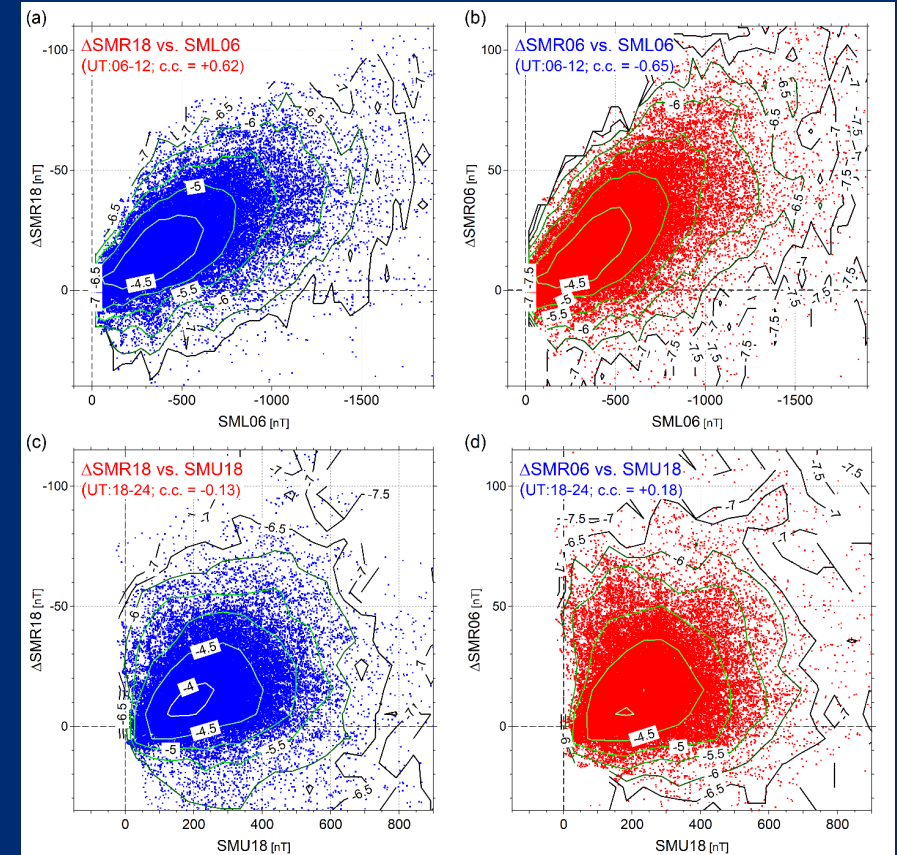


Fig. (a) ΔSMR18 vs. SML06, (b) ΔSMR06 vs. SML06, (c) ΔSMR18 vs. SMU18, and (d) ΔSMR06 vs. SMU18 along with equi-contours of the PDF at equal logarithmic intervals. See the bullets in the left for details.

Dawn-dusk asymmetry of ground magnetic depression during geomagnetic storms can be attributed to the recurrent formation of the dawnside wedge current system