



Large-scale vortices in the auroral region associated with high speed flows

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Using IMAGE FUV and Polar UVI data, we have identified several cases of giant auroral vortices appearing at the poleward boundary of the nightside auroral oval. Typically, the vortex event starts as a polewardly displaced auroral bulge at the pre- or postmidnight sector which further develops into a giant spiral with a diameter of 800-1100 km. The spirals fade away after some tens of minutes.

Common for all events are extremely high solar wind speeds of 700-1000 km/s. The majority of the events occurred during high speed streams related to Corotating Interaction Regions (CIRs) with an Interplanetary Magnetic Field (IMF) of average magnitude and fluctuating around zero. However, one auroral vortex appeared at the end of a Coronal Mass Ejection (CME) associated magnetic cloud, during mainly northward IMF conditions.

The close association of a very high solar wind velocity with these giant auroral vortices suggests that they may be connected to Kevin-Helmholtz instabilities along the magnetopause flanks.