

## **INFERRING GLOBAL RECONNECTION TOPOLOGY FROM KINETIC SIGNATURES INSIDE KELVIN-HELMHOLTZ VORTICES**

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During a long lasting period of northward interplanetary magnetic field and high solar wind speed (above 700 km/s), the Cluster spacecraft go across several extremely large fully developed Kelvin-Helmholtz vortices at the dusk flank magnetopause. Plasma transport from the solar wind to the magnetosphere is unambiguously evidenced by the presence of alpha particles on the magnetospheric side of the vortices. But the peculiar characteristic of the present event is a particular sequence of ions and electrons distribution functions observed repeatedly inside each vortex. In particular, whenever Cluster crosses the current layer inside the vortices, multiple field-aligned ion populations appear, suggesting the occurrence of reconnection. In addition, the ion data display a clear velocity filter effect both at the leading and at the trailing edge of each vortex. This effect is not present in the simultaneous electron data. The observations are interpreted in terms of lobe reconnection occurring in the southern hemisphere which produces, besides one fully detached field line, one open field line with a foot in the southern ionosphere. This field line is convected tailward, thereby becoming embedded in the vortices. The proposed scenario accounts for all the observational aspects, regarding both the kinetic signatures and the transport process.

Kelvin-Helmholtz vortices, solar wind transport to the magnetosphere, lobe reconnection

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