



Onset of reconnection observed by Cluster in the mid-altitude polar cusp

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Temporal variations of ion precipitation in the mid-altitude polar cusp are investigated using the four Cluster spacecraft. On 7 Aug. 2004, Cluster 4 was moving poleward through the Northern cusp, followed by Cluster 1, Cluster 2, and finally Cluster 3. The Wind spacecraft detected a Southward turning of the Interplanetary Magnetic Field (IMF) at the beginning of the cusp crossings and IMF-Bz stayed negative throughout. Cluster 4 observed a high energy step in the ion dispersion around 1 keV on the equatorward side of the cusp. C1, entering the cusp around 1 minute later, did not observe the high energy step anymore but a partial dispersion with a low energy cut-off reaching 100 eV. About 9 min later, C3 entered the cusp and observed a full ion dispersion from a few keV down to around 50 eV. The open-closed boundary, identified by electron precipitation, was initially moving equatorward at a rate of -0.43 ILAT/minute at the beginning of the event and then slowed to -0.16 ILAT/minute, suggesting the erosion of the dayside magnetosphere under IMF Southward. This event is explained by the onset of dayside reconnection when the IMF turned southward; the step being the first signature of the reconnection that would then evolve as a full dispersion as reconnection goes on.