



The relationship between solar wind entry processes and transpolar arc formation

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Recently, Cluster observations revealed the presence of solar wind plasma entry regions in the high latitudes of the Earth's magnetosphere, i.e. the lobes tailward of the cusp region, mostly during periods on northward IMF. Such periods of northward IMF are associated with the presence of transpolar arcs. We use observations from the GUVI experiment onboard the TIMED spacecraft to investigate a possible link between solar wind entry in the high latitude magnetosphere and the formation of transpolar arcs. For ~ 20 solar wind entry events from ~ 100 , transpolar arcs were evidenced by the GUVI imager. The properties of ions and electrons in the entry regions, their connection with transpolar auroras and the correlations with IMF conditions are examined for the most intense events using multiple spacecraft data (Cluster, TIMED, DMSP, IMAGE, POLAR). The time evolution and asymmetries between the two hemispheres for these transpolar arcs are also discussed.