



Multi-instrument observations of a transpolar arc in the northern hemisphere

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A transpolar arc associated with dayside and nightside reconnection was imaged by IMAGE throughout a 5-hour interval on 05 January 2002. Observations indicate that a burst of nonsubstorm nightside reconnection was responsible for the formation of the arc. The subsequent motion of the arc was controlled by the amount of open flux being added from the dusk sector polar cap to the dawn sector, which can happen during By dominant interplanetary magnetic field (IMF) condition. SuperDARN HF radar measurements of the convection flow provide further evidence of the expansion and contraction of the polar cap under different IMF orientations. Finally, comparing images from IMAGE and convection flow from SuperDARN measurements, vortical flows occurred exactly at formation of the transpolar arc.