

Mesoscale flow dynamics related to a southeastward-moving auroral transient in the cusp

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In this paper we focus on a mesoscale phenomenon that moves in the southeastward direction on the poleward side of the stable cusp precipitation region, using data from a high-sensitivity all-sky imager and the EISCAT radar at Longyearbyen, Svalbard. During an interval of weakly southward IMF on 13 January 2013 EISCAT northwestward-directed low-elevation measurement detected an enhanced southeastward flow accompanied by the clear increase both in the ion and electron temperatures. The all-sky imager shows that a mesoscale aurora form is detached from the poleward boundary of the stable cusp precipitation region at ~1130 MLT, and that it moves rapidly in the direction expected from the radar observation. When this aurora form reaches the local noon, it slows down, and then diminishes. We present detailed characteristics of the mesoscale flow dynamics related to this auroral form, and discuss whether or not this phenomenon can fall in the category of the usual poleward-moving auroral form.

Keywords: aurora, cusp, particle precipitation, plasma flow, solar wind magnetosphere interaction