

Estimating possible source of polar cap patches by using OMTI and SuperDARN

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Highly sensitive all-sky airglow imager (Optical Mesosphere Thermosphere Imager: OMTI) has been operative at Resolute Bay, Canada (geographic latitude 74.7; geomagnetic latitude 82.9) since January 2005. Primary target of this optical measurement is polar cap patches, which are defined as a region of plasma density enhancements drifting anti-sunward across the polar cap. In this paper, we have estimated possible source of polar cap patches by tracking the center of gravity of patches backward with plasma convection vectors derived from the Super Dual Auroral Radar Network (SuperDARN). We also developed an algorithm for detecting polar patches automatically over Resolute Bay. Applying these two methods to all patches observed so far, we computed statistical distribution of their source region. Relationship between the characteristics of the source and upstream IMF conditions is discussed in terms of several generation mechanisms of polar cap patches.