

Rankin Inlet PolarDARN radar observations of duskward moving Sun-aligned optical forms

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On 15 February 2007, several duskward moving sun-aligned (SA) auroral forms have been observed by the all-sky camera at Resolute Bay, NWT (Canada). Concurrent observations with the Rankin Inlet (RANK) PolarDARN HF radar within the field-of-view of the camera showed signatures of moving auroral forms in all signal parameters with the most remarkable effects being the echo power drop and velocity reversal as the arc reached a specific radar beam/gate. Spatial and temporal variations of the velocity in the vicinity of the SA form are investigated. It is shown that the form-associated convection reversal was located poleward (duskward) of the global-scale convection reversal associated with the dawn cell of the large-scale convection pattern. Thus, the RANK radar was monitoring the polar cap portion of the global-scale convection pattern and its transition from the IMF $B_y < 0$ to the $B_y > 0$ situation. Magnetic perturbations associated with the SA form passing the zenith of several magnetometers are investigated. It is shown that although magnetometer signatures of the moving form were clear, the convection pattern derivation from magnetometer records alone is not straightforward.