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Characteristics of isolated high-latitude aurora

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We examine extremely high-latitude aurora as identified by the DMSP F13 satellite. In particular we investigate single isolated large-scale regions of particle precipitation which may correspond to transpolar arcs as identified by Polar UVI. These events are chosen without regard to IMF orientation. There are 73 events where DMSP F13 measures emissions which occur near the noon-midnight meridian and are spatially separated from both the dawnside and duskside auroral ovals by wide regions void of precipitating particles. Most of these events consist of a continuous region of precipitating particles. The occurrence and characteristics of these aurora are examined in order to determine the influence of IMF strength and orientation, the solar wind, and Earth dipole tilt. All of the events identified occur during northward or weakly southward IMF conditions and follow a change in IMF By. Correlations are seen between the field-aligned currents and plasma flows associated with the arcs, implying local closure of the FACs. Strong correlations are seen only in the sunlit hemisphere. The convection associated with the arcs is localized and has little influence on the large-scale convection even assuming that the arcs are transpolar. This also implies that the sunward flow along the arcs is “unrelated” to the overall magnetospheric topology.