

A long-lasting auroral bright spot around magnetic north pole: Is it the evidence of stable magnetic reconnection?

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An intense and large auroral bright spot appears around the magnetic north pole observed by the Special Sensor Ultraviolet Spectrographic Imager (SSUSI) on board four different Defense Meteorological Satellite Program (DMSP) satellites during long time northward IMF conditions. The bright spot is even brighter than aurora in the auroral oval which is about 5-10° magnetic latitude equatorward of the bright spot. The bright spot is lasting about 8 hours, and sometimes appears as a cyclone-shape with a clockwise rotation. The DMSP in situ plasma observations suggest that the bright spot is clear associated with electron invert-V acceleration with 10s keV energy electron precipitations around the center regions and 1s keV energy electron precipitations around the egde regions. There are also strong flow shears between the two sides of the bright spot: strong sunward flows on the duskside and antisunward flows on the dawnside. These types of plasma should come from the high-latitude lobe region of the magnetotail due to the high-latitude lobe magnetic reconnections. Is it the evidence of stable lobe reconnection during long time northward IMF conditions? The detail and further analysis should be pursued in the following studies.

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