Interhemispheric conjugacy of auroral poleward expansion observed with an imaging riometer network and HF radars

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Interhemispheric conjugacy of auroral poleward expansion was studied with a network of imaging riometers located at east Greenland and Svalbard in the arctic and at Zhongshan Station in Antarctica in the period of 1997-1998.

For the poleward expanding CNA events observed in the northern hemisphere, more than half of them wereobserved simultaneously at the conjugate area in Antarctica. Poleward expanding CNA sometimes show easterly, or westerly deflection, and this feature is discussed in connection with the IMF By variations.

The overhead region of this network is observed by SuperDARN HFradars. The radar echo usually disappeares when the poleward expanding CNA appears. Spatial-time evolution of the regions of echo disappearance and CNA was compared and discussed.

Auroral poleward expansion is a strong manifestation of the substorm
expansion phase, and it can be observed by a riometer network as
multiple-step progress of the absorption region into the polar cap
(Stauning, 1995). Interhemispheric conjugacy of this phenomena was studied with a network of imaging riometers from east Greenland to Svalbard and in their conjugate region in Antarctica.

We have analyzed the data from
Danmarkshavn in East Greenland, Ny-Alesund and Longyearbyen in Svalbard, and Chinese Zhongshan Station in antarctica in the period of 1997-1998. For the poleward expanding CNA events observed in the northern hemisphere, more than half of them were observed simultaneously at Zhongshan Station. Local time dependense of the conjugate point latitude is discussed, making
use of the longitudinal extent of the network. Poleward expansion sometimes show easterly, or westerly deflection as observed by the imaging riometers, and this feature is discussed in connection with the IMF By variations.

The area of this imaging riometer network is covered by SuperDARN HFradars. HF radar echo usually disappeares when the poleward expansion takes place due to enhanced D-region absorption and/or reflection of the transmitted
signal by sporadic auroral E-region. It is therefore difficult to obtain
electric field inside the poleward expansion. However, the area of the echo disappearence provides the information about the spatial extent of the absorption, and this is directly compared with the absorption observed by the riometers.