

Comparison between emission intensities of magnetic conjugate aurora

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Aurora has a lot of information on the magnetosphere along a magnetic field line. The magnetic field of the Earth has a shape close to a dipole, and two ground points connected by a magnetic field line like a Husafell and Syowa Station pair are called geomagnetic conjugate points. The aurora which appears over both points is called geomagnetic conjugate aurora. We observed aurora simultaneously at magnetic conjugate points and compared intensity, shape, and appearance frequency of the conjugate auroras. In general, the conjugate aurora becomes similar shape, if the magnetosphere is symmetric. However, the conjugate property of the aurora along with the states of the magnetosphere and the ionosphere is not always maintained. When, the magnetic field line dynamically change in response to temporal variations in the interplanetary magnetic field (IMF) orientation, it has been sometimes observed that similar auroras change suddenly into dissimilar auroras in a few minutes. One of the causes of this non-conjugate property is an asymmetric diversity in the northern and southern field-aligned acceleration regions that exist around altitudes of 3000~10000 km. Difference in the auroral intensity could result from the interhemispheric difference in the fluxes of auroral particle precipitation. In this study we compare auroral intensities during an event on September 9 and 10, 2011, and also statistically compare emission intensities of auroras observed at Syowa Station and Iceland conjugate points.

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