

Correlation between pulsating auroras and chorus waves observed at Athabasca (L=4.4), Canada

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We analyze the correlation between the intensities of pulsating aurora and amplitude of chorus waves observed at Athabasca, Canada, on February 16-27, 2012 during the VLF-CHAIN campaign carried out by STEL, Nagoya University and Kanazawa University. During the campaign, pulsating aurora patches and chorus waves, originating at the equator of the inner magnetosphere at L=4.4, were simultaneously observed on the ground on February 19, 2012, showing good correspondence of their on/off signatures. In the initial analysis, we found that the chorus waves have arrived at the observation point ~1.7s earlier than the auroral pulsations. Comparing the observed chorus frequency with the cyclotron frequency in the equatorial plane of the source magnetosphere using a geomagnetic field model, we infer that the time lag of ~1.7s may be caused by auroral electron reflection in the opposite hemisphere. For further analysis, we will search more events showing good correlation between aurora intensity and VLF wave amplitude observed during the campaign. In addition, we will investigate relation between frequency changes of VLF chorus waves and latitudes of corresponding pulsating patches, using 2-dimensional image data.

References

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