

Semi-annual variation of CNA observed at Poker Flat, Alaska

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We have analysed the occurring frequency of the CNA phenomena in the polar region, by using the CNA data set from October 1995 to July 1999 which was obtained from the measurement by an imaging riometer at Poker Flat, Alaska. The result clearly shows a semi-annual variation in the monthly rate of CNA occurring days. It is known that the geomagnetic activity and the IMF Bz component also have a similar seasonal variation. These results suggest that the CNA semi-annual variation is closely related to the solar wind-magnetosphere coupling process.

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The imaging riometer can observe two-dimensional distribution of CNA covering 400 by 400 km at 90 km in altitude by means of 256 element cross-dipole antenna array and Butler matrix. In this study, the CNA data from a beam pointing around zenith was used to obtain the average number of days per month when the CNA larger than 1 dB was observed during each day. As a result, it is found that there is a clear semi-annual variation characteristic in the CNA occurring frequency, having maximum in equinoxes and minimum in solstices. It is known that the geomagnetic activity and the IMF Bz component also have a similar seasonal variation (e. g., Aruliah et al., 1996). These results suggest that the CNA semi-annual variation is closely related to the solar wind-magnetosphere coupling process. In this presentation, we will discuss the seasonal variation in CNA as well as the comparison with seasonal variation in other processes.