

Compilation of a Database of Simultaneous CNA and Auroral Images - 256-element Imaging Riometer Observation in Alaska -

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We are constructing a database of the cosmic radio noise absorption (CNA) obtained from the 256-element imaging riometer which was installed at Poker Flat, Alaska in October 1995 and one-minute panchromatic all-sky auroral images which are opened to the public by the Geophysical Institute of University of Alaska Fairbanks. Up to now, we have compiled the image data of about 100 days from January to March and from October to December in 1996. For promoting open use of the obtained data to general users and to researchers, we will include the database in the system for Alaska middle atmosphere observation data network (SALMON).

As part of the cooperative research with the Geophysical Institute of the University of Alaska Fairbanks (GI/UAF), we installed the 256-element imaging riometer at Poker Flat, Alaska (65.1N, 147.5W; geomag. 65.5N, 100.2W) in October 1995, and have been observing two-dimensional distributions of the cosmic radio noise absorption (CNA). This imaging riometer can observe the distribution of CNA in the upper atmosphere within 70 degrees from the zenith (400x400 km at a height of 90 km) every second with 208 pencil beams. The maximum horizontal resolution of the measurement is about 11 km around the zenith at a height of 90 km. For comparing the obtained 2-D CNA data with optical aurora data, we use the JPEG files of one-minute panchromatic all-sky auroral images which are opened to the public by GI/UAF through the Internet. Up to now, we have completed the database of the image data of about 100 days from January to March and from October to December in 1996. Each JPEG file of auroral image is composed of 243x256 data points. Therefore, to facilitate comparison between 2-D CNA and aurora images, the meridian-time plot (=keogram), and so forth, we have developed the software to reform the JPEG images to the images with the same spatial resolution as that of the CNA images. For promoting open use of the obtained data to general users and to researchers, we will include the database in the system for Alaska middle atmosphere observation data network (SALMON). In general, the aurora is caused by the precipitated electrons with energy of several keV, while, CNA is caused by electrons with higher energy of several tens of keV. The auroral images that we used for are not the monochromatic images. For detailed analysis on the average energy and variations in the energy spectrum of the precipitated particles, we need to compare CNA with monochromatic images of the CRL multi-color all-sky imagers which started recently, or with optical data of the meridian scanning photometer of GI/UAF. The database compiled this time is expected to be an easy-to access archive as reference information for these studies.