

Development of ULF wave database conjugately observed at Syowa and Iceland

KOSHIDA, Tomonori^{1*}, YAMAGISHI, Hisao¹, OKADA, Masaki¹

¹National Institute of Polar Research

The Energization and Radiation in Geospace (ERG) satellite will be launched in 2014 or 2015 to observe the inner magnetosphere. In conjunction with this, the existing observation network on the ground is to be redeveloped. As part of these developments, observation data from induction magnetometers installed in Antarctica and Iceland have been arranged. There are three observation points in Iceland and one station in Antarctica. In Iceland the sampling frequency is 2 Hz; on the other hand, at Syowa station, the sampling frequency is 20 Hz. Induction magnetometers are installed along with fluxgate magnetometers and riometers. The data are sent to Japan in a quasi-real-time manner. By making dynamic spectra from these data, we are developing a database of ultralow-frequency (ULF) waves. In the future, we intend to create a database environment that can compare the ERG satellite data with the ULF observation data simultaneously in a quasi-real-time manner. Currently, dynamic spectra have been developed for the period from February 2003 to January 2011. This period is consistent with that of CDF data files from the Syowa station. The frequency ranges of the developed dynamic spectra are 0-1 Hz and the durations are 24 h. To remove the effects of DC and anti-aliasing filters whose cutoff is 1 Hz, the averaged background is deducted from the FFT spectra data from the Iceland stations. Frequency ranges of FFT spectra from Syowa station are 0-10 Hz. Therefore, frequency ranges of 0-1 Hz are extracted from these data in addition to the aforementioned deducting procedure. As a feature of the conjugate observations, differences in attenuations of received signals between the summer and winter hemispheres are indicated. The intensities of the observed phenomena in the dynamic spectra of the summer hemisphere are weaker than those observed in the winter hemisphere. These attenuations are considered to be related to propagating processes in the ionospheric waveguide. Development of the database is proceeding, and we intend to publish it on a website in the near future.

Keywords: conjugate observation, ultralow-frequency, database development