

IUGONET activities for upper atmospheric research

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Inter-university Upper atmosphere Global Observation NETwork (IUGONET) is a Japanese inter-university project, which provides research infrastructure for sharing ground-based observational data of upper atmosphere. We present the activities made by IUGONET for upper atmospheric research. The upper atmospheric science is characterized by the following properties: (1) Both vertical coupling between multiple spheres and global horizontal circulation are essential. (2) There are a variety of data sets obtained by many kinds of instruments. (3) It is important to monitor the long-term trend. In order to study phenomena in the upper atmosphere, therefore, it is necessary to analyze various data. However, it is often difficult to search and access the data, because database has been built and maintained individually by each university or institute. In addition, there are a variety of data sets, resulting in many types of file formats, so collection and analysis of the data are time-consuming.

To overcome these issues, we have mainly developed two tools; one is a metadata database for cross-searching various kinds of the upper atmospheric data distributed across the IUGONET members, and the other is an analysis software for visualizing and analyzing these data in an integrated fashion. We adopted Space Physics Archive Search and Extract (SPASE) metadata model as a basis of the IUGONET metadata format. We have already registered more than 10 million metadata to our metadata database. Our analysis software is based on Space Physics Environment Data Analysis Software (SPEDAS), which is a grass-roots data analysis software written in Interactive Data Language (IDL) for the space physics community and supports multiple missions. We have provided a plug-in software for SPEDAS, which enables users to deal with the IUGONET data on SPEDAS. Furthermore, we have held meetings about twice a year to

introduce how to use these IUGONET data and tools.