The IUGONET project - objectives

- Because exchanges of materials, momenta, and energies in the upper atmosphere take place through complicated physical processes at different layers, integrated analysis by using various kinds of observational data is essential for investigating the mechanism of long-term variations in the upper atmosphere.
- However, the databases of such observations have been managed and maintained by each institution that conducted the observations. There is no way to cross-search these databases.
- The purpose of this project is to develop a metadata database (MDB) of the upper atmospheric data by ground-based observations accumulated since IGY by Japanese research institutes, and then to promote effective use of the observational data spread across the institutes, which will lead to interdisciplinary, comprehensive studies of the upper atmosphere.

Inter-university collaboration

- A six-year research project, Inter-university Upper atmosphere Global Observation NETwork (IUGONET), was initiated in 2009 by the five Japanese universities/Institutes (NIPR, Tohoku Univ., Nagoya Univ., Kyoto Univ., and Kyushu Univ.) that have been leading ground-based observations of the upper atmosphere for decades.
- The MDB will be of great help to researchers in efficiently finding and obtaining various kinds of observational data we have obtained for many years by the global network of radars, magnetometers, optical sensors, helioscopes, and so on.

Development of MDB system

- The IUGONET MDB system is being built on the platform of DSpace, which is widely used by digital repositories in many universities over the world.
- DSpace provides fundamental functions of registering, retrieving, providing and harvesting of metadata written in the IUGONET common metadata format.
- Users will be able to access the IUGONET MDB by using any browsers and get various info of observational data through the metadata.

Development of analysis software

- The IUGONET is developing an integrated data analysis tool based on TDAS (THEMIS Data Analysis Software Suite) composed of IDL routines. The software will have capability to get, visualize and analyze data distributed from the institutions in our project.
- The data analysis software will provide both the GUI (Graphical User Interface) and the CUI (Character User Interface), in order to enable even beginners to utilize its functions. Any user will be able to use the GUI-based software developed by IUGONET on the free IDL Virtual Machine.
- Our software development is conducted in collaboration with the ERG Science Center.

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IUGONET common metadata format = SPASE + modifications

- We investigated widely-used metadata formats in various scientific fields in the course of the development of the IUGONET metadata format.
- Among them we selected the SPASE data model/metadata format as the base of the IUGONET metadata format since it matches best the upper atmospheric data and holds expandability to fit any kinds of observational data.
- A few modifications according to characteristics of our observational data have been added.

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