ID de Contribution: **12** Type: **Non spécifié**

IUGONET activity for upper atmosphere study

mardi 20 octobre 2020 13:10 (10 minutes)

In the Earth's upper atmosphere above about 60 km, including the mesosphere, thermosphere, and ionosphere, various phenomena are generated by energy inputs from higher regions (e.g., solar radiation, solar wind, and particle precipitation from the magnetosphere) and from the lower atmosphere (e.g., atmospheric waves). Thus, comprehensive analysis of various kinds of satellite and ground-based observational data in the multiple regions is important to understand physical mechanism of the phenomena. Inter-university Upper atmosphere Global Observation NETwork (IUGONET) project started in 2009 to share and effectively analyze such various upper atmospheric data, including solar and planetary data, which have been accumulated by Japanese universities and institutes for more than 60 years. We present our activities to share the upper atmosphere data and facilitate interdisciplinary studies regarding solar-terrestrial physics (STP).
We have supported the research activity in the STP field through the release of the upper atmosphere data, the development of data search and analysis tools, and the education of young scientists. We have supported publishing various upper atmosphere data in collaboration with many STP projects, such as EISCAT, SuperDARN, PWING, and ERG. We have also provided a data analysis software, called "iUgonet Data Analysis Software (UDAS)", and a data service, "IUGONET Type-A", to accelerate comprehensive data analysis. UDAS is a plug-in software for Space Physics Environment Data Analysis Software (SPEDAS), which allows researchers to analyze various types of the IUGONET data in an integrated fashion. IUGONET Type-A is a one-stop data service to search data, show information of data (via metadata and quick-look plots), identify events of interest, interactively create stacked-plot, and guide users to advanced analysis with SPEDAS. The IUGONET metadata is based on the Space Physics Archive Search and Extract (SPASE) data model to ensure interoperability with other STP missions. In order to produce scientific output effectively using the IUGONET data and tools, we regularly hold data analysis workshops for young researchers in Japan and other countries (e.g., Indonesia, Malaysia, India, China, Nigeria). As a result, many research papers including the Master and Doctor theses have been published by using the IUGONET data and tools.

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Abstract

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Classification de Session: SPASE