



## **Challenge to the Data-intensive Science in Upper Atmospheric Research in Japan**

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Science is changing because of the impact of information technology. Experimental, theoretical, and computational science are all being affected by the data deluge, and a fourth, "data-intensive" science paradigm is emerging. To investigate the mechanism of long-term variations in the upper atmosphere, we need to create integrated links between a variety of ground-based observations made at various locations from the equator to the poles because what we observe is the result of complicated processes. However, the Japanese observational databases (e.g., by a global network of radars, magnetometers, optical sensors, helioscopes) have been maintained and made available to the community by each institution that conducted the observations. Then researchers encountered the problem that is difficult to look for various kinds of observational data to clarify the global scale physical phenomena. In order to solve the problem, the Japanese IUGONET project builds the metadata database for upper atmosphere by using extended Dspace software. The extended point is to handle the IUGONET XML Schema for describing the ground-based observational metadata, which is based on Space Physics Archive Search and Extract (SPASE) for describing satellite' metadata. Metadata by the XML schema can describe the twelve resource types like dataset, person, and so forth. Thereby, the researchers can reach distributed observational data via metadata.

From the viewpoint of data publication, the Japanese local community of the World Data System (WDS) started to prepare to put the Digital Object Identifier (DOI) to dataset by Japan Link Center (JaLC) which is the DOI registration agency in Japan. On the other hand, Open Researcher & Contributor ID (ORCID) launched its registry service on Oct. 2012. Under these situation, we planned to put the both IDs into the above mentioned metadata to create linkage between dataset, data contributor, and metadata. As a first step, we redefined the new IUGONET XML Schema including DOI and ORCID information.