

PEM036-30

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Inter-university Upper atmosphere Global Observation NETwork (IUGONET) - Development of metadata database -

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Purposes of this 6-year (2009-2014) project are:

- to develop a metadata database (DB) of the upper atmosphere (UA) data by ground-based observation accumulated over 50 years since IGY by Japanese institutes/universities.
- to promote effective use of the observational data and comprehensive studies of the UA.
- to investigate mechanism of long-term variation in the UA

This project is supported by Special Educational Research Budget (Research Promotion), MEXT, Japan

Participating universities and research institutes

- Planetary Plasma and Atmospheric Research Center, Tohoku University
- National Institute of Polar Research
- Solar Terrestrial Environment Laboratory, Nagoya University
- Research Institute for Sustainable Humanosphere, Kyoto University
- World Data Center for Geomagnetism, Kyoto University
- Kwasan and Hida Observatories, Kyoto University
- Space Environment Research Center, Kyushu University

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S. Abe
- Member of core development team**
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Observations by IUGONET institutions

Iceland
aurora imager x2
magnetometer x3

Toromso
IS radar (EISCAT)
meteor radar
MF radar

**MU radar
@Shigara
ki**

**SuperDARN
Hokkaido HF
radar**

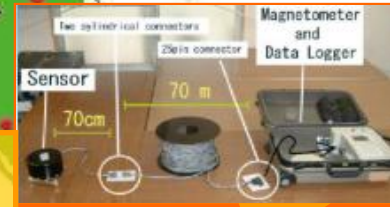
**Solar
observatory
(Kyoto Univ.)**

**Equatorial Atmospheric Radar
(EAR)**

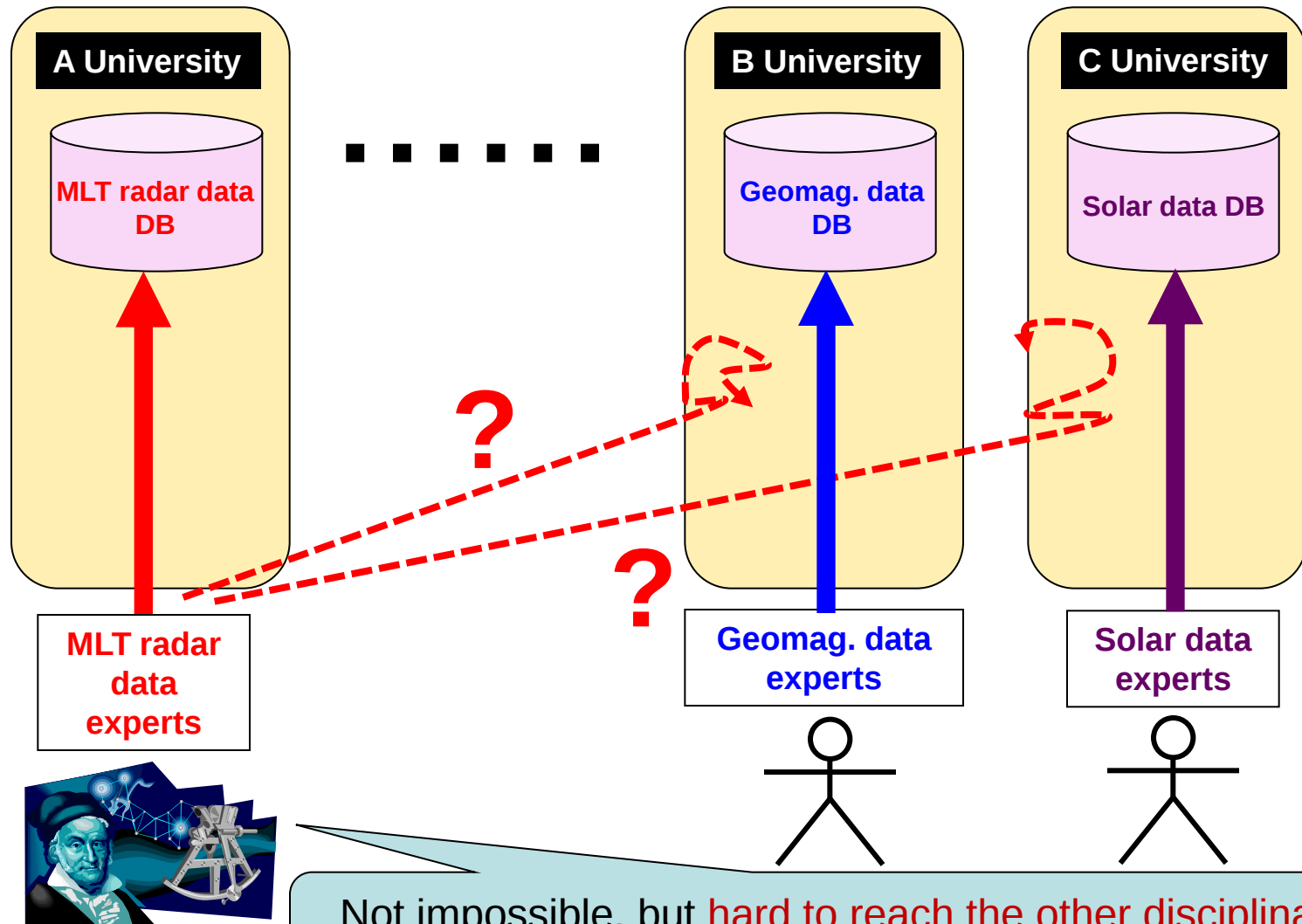
**litate, Onagawa
radio teloscope
magnetomter**

SYOWA base
SuperDARN radar x2
MF radar
aurora imagers
magnetometer chain
ELF obs. (conjugate with
Onagawa)

**Svalbard: IS radar
(EISCAT),
meteor radar, aurora imager**

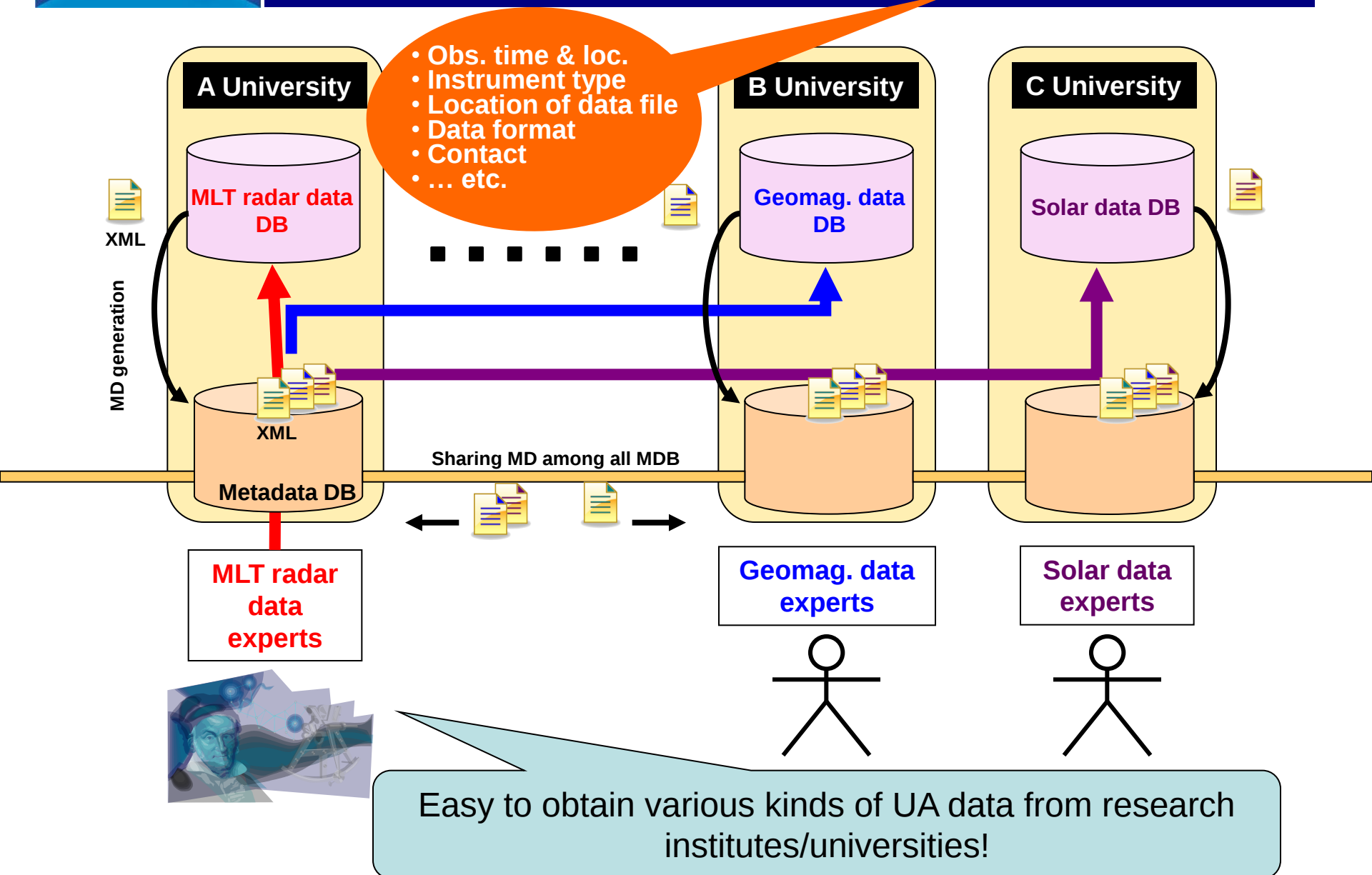


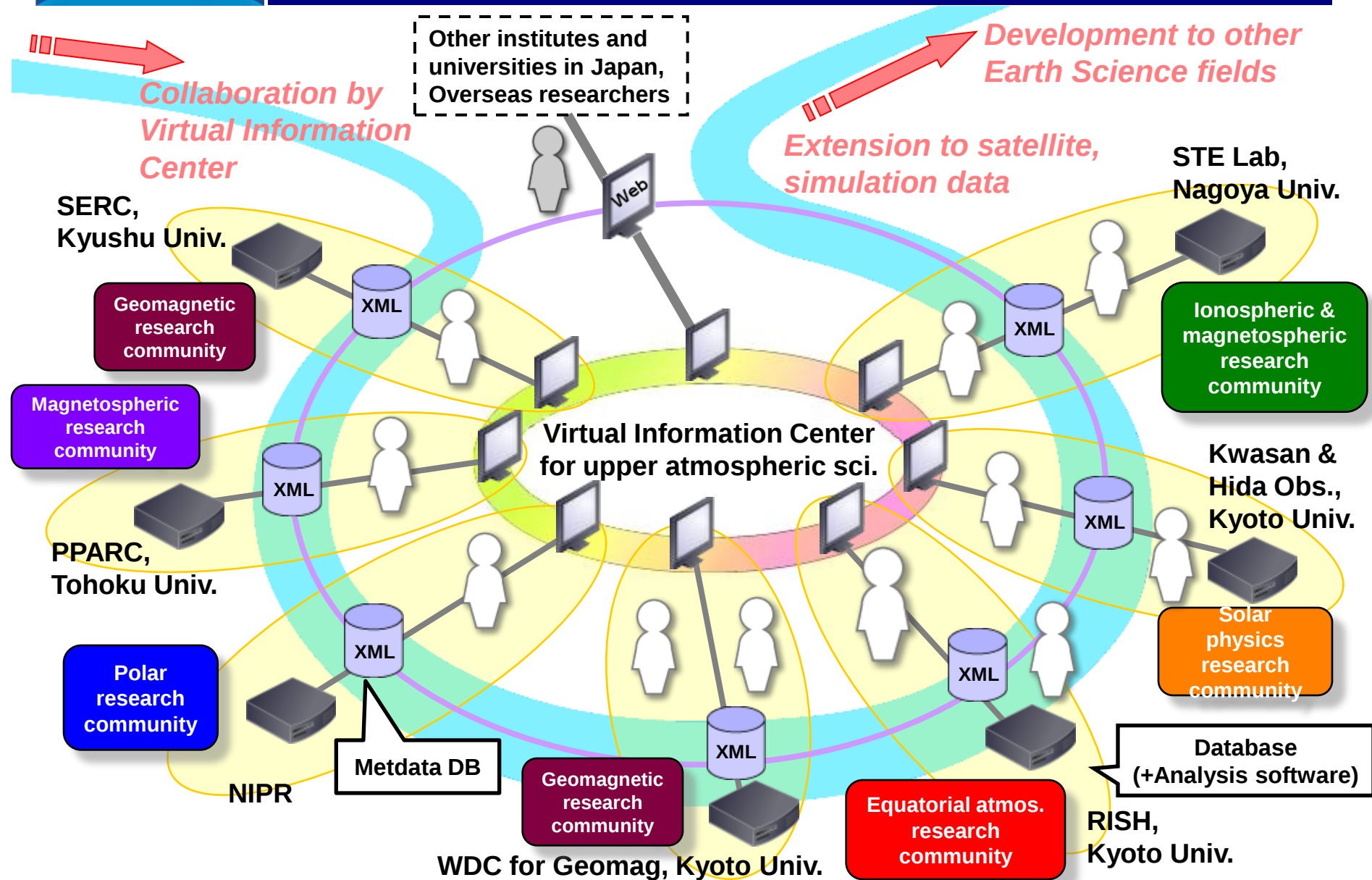
- MST radar
- ▲ MF / meteor radar
- ◆ MAGDAS magnetometer
- ★ FM-CW radar
- OMTI imager
- WDC magnetometer



Not impossible, but **hard to reach the other disciplinary data!**

Database access through metadata DB

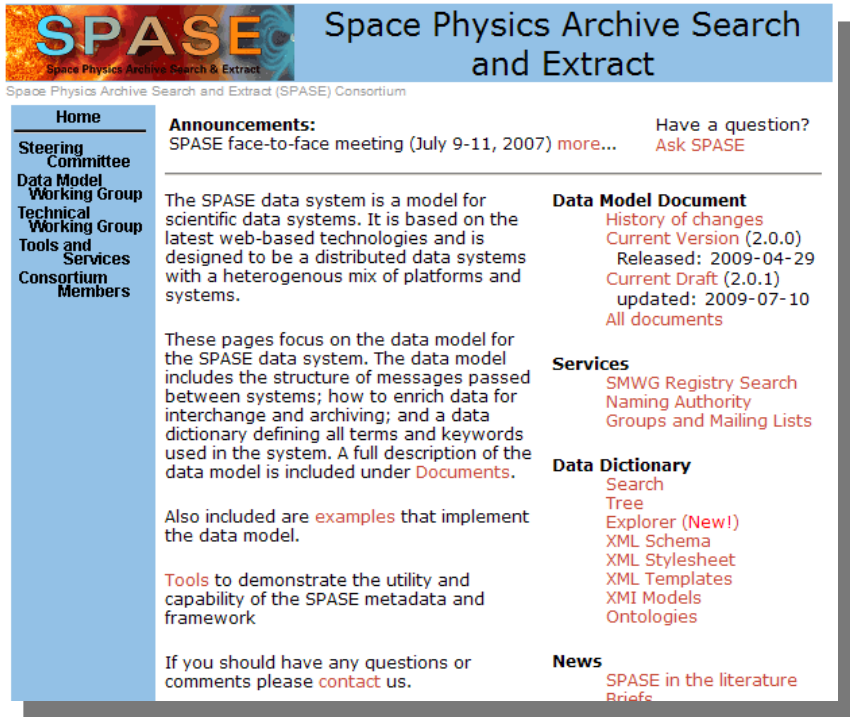




Task	Y2009	Y2010	Y2011	Y2012	Y2013	Y2014	Detail
Virtual information center (VIC) of UA studies	System installation →	Normal operation		System update		→	Construct the integrated research environment (TV-conference system, ..)
Development of metadata DB system	Prototype system devel. →	Regular system devel.	Open to public			→	Design and develop the metadata DB system
Design the Metadata format standards	Ver.1 format →	Update & document				→	Release the format ver.1 and keep updating if necessary
Development of data analysis software	Specifications and basic design →	Programming	Open to public			→	Develop and release analysis softwares for UA data
Maintenance&extension of existing DBs of Observation data		Maintenance of obs. DBs & exam. of non-digital dataset →		Effort focused on old data from Y2012 on		→	Incorporate non-DB'd data into the DBs
Metadata generation		Collecting metadata from each obs. DB →		Effort focused on old data from Y2012 on		→	Generate metadata in the designated format and add to metadata DB
Operation of metadata DB			→			→	Release the metadata DB for community
VIC extension to related fields						→	Wrap up the project and discuss further extension

IUGONET metadata format = SPASE + modifications

(<http://www.spase-group.org>)



SPASE Space Physics Archive Search and Extract

Space Physics Archive Search and Extract (SPASE) Consortium

Home

Steering Committee

Data Model Working Group

Technical Working Group

Tools and Services Consortium Members

Announcements:
SPASE face-to-face meeting (July 9-11, 2007) [more...](#)

Have a question?
[Ask SPASE](#)

The SPASE data system is a model for scientific data systems. It is based on the latest web-based technologies and is designed to be a distributed data systems with a heterogenous mix of platforms and systems.

Data Model Document
[History of changes](#)
[Current Version \(2.0.0\)](#)
Released: 2009-04-29
[Current Draft \(2.0.1\)](#)
updated: 2009-07-10
[All documents](#)

Services
[SMWGW Registry Search](#)
[Naming Authority](#)
[Groups and Mailing Lists](#)

Data Dictionary
[Search](#)
[Tree](#)
[Explorer \(New!\)](#)
[XML Schema](#)
[XML Stylesheet](#)
[XML Templates](#)
[XMI Models](#)
[Ontologies](#)

These pages focus on the data model for the SPASE data system. The data model includes the structure of messages passed between systems; how to enrich data for interchange and archiving; and a data dictionary defining all terms and keywords used in the system. A full description of the data model is included under [Documents](#).

Also included are [examples](#) that implement the data model.

[Tools](#) to demonstrate the utility and capability of the SPASE metadata and framework

If you should have any questions or comments please [contact](#) us.

News
[SPASE in the literature](#)
[Briefs](#)

SPASE

metadata format developed by international consortium to comprehensively describe research resources regarding heliospheric and magnetospheric satellite observations

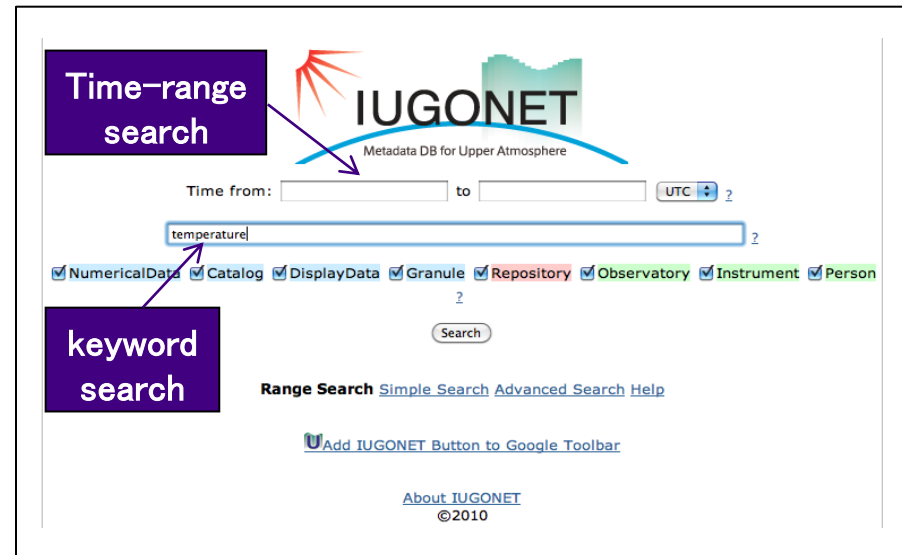
- closely related to STP and upper atmosphere researches (→ easy to use as a base format)
- new metadata elements & words appendable (→ customizable according to our data)
- widely-used in VxOs (→ possible metadata exchange in the future)

IUGONET's modifications

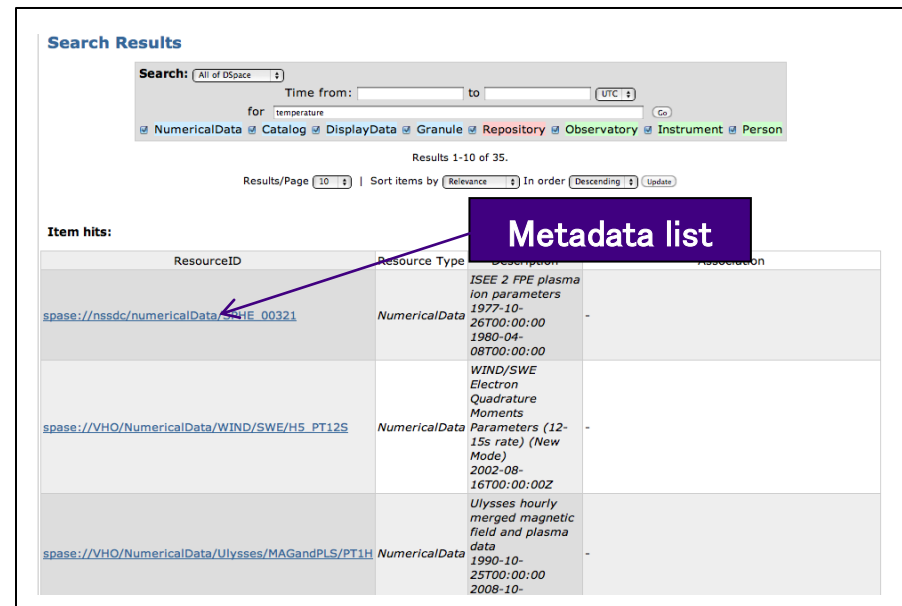
- additional words to represent non-digital archives
- additional words to represent heliospheric coordinates
- new metadata elements to describe observation location & range

Prototype of MDB system is being developed by an existing repository software (**DSpace**).

- able to register, search, collect, and provide metadata
- able to handle arbitrary metadata formats
- free, and widely used (e.g. digital academic repositories)



The image shows the IUGONET search interface. At the top, there is a logo for IUGONET with the tagline 'Metadata DB for Upper Atmosphere'. Below the logo, there are two main search sections: 'Time-range search' and 'keyword search'. The 'Time-range search' section has a 'Time from:' field, a 'to' field, and a 'UTC' button. The 'keyword search' section has a text input field containing the word 'temperature'. Below these fields, there are several checkboxes for search criteria: NumericalData, Catalog, DisplayData, Granule, Repository, Observatory, Instrument, and Person. A 'Search' button is located below the checkboxes. At the bottom, there are links for 'Range Search', 'Simple Search', 'Advanced Search', and 'Help', as well as a link to 'Add IUGONET Button to Google Toolbar' and a copyright notice '©2010'.



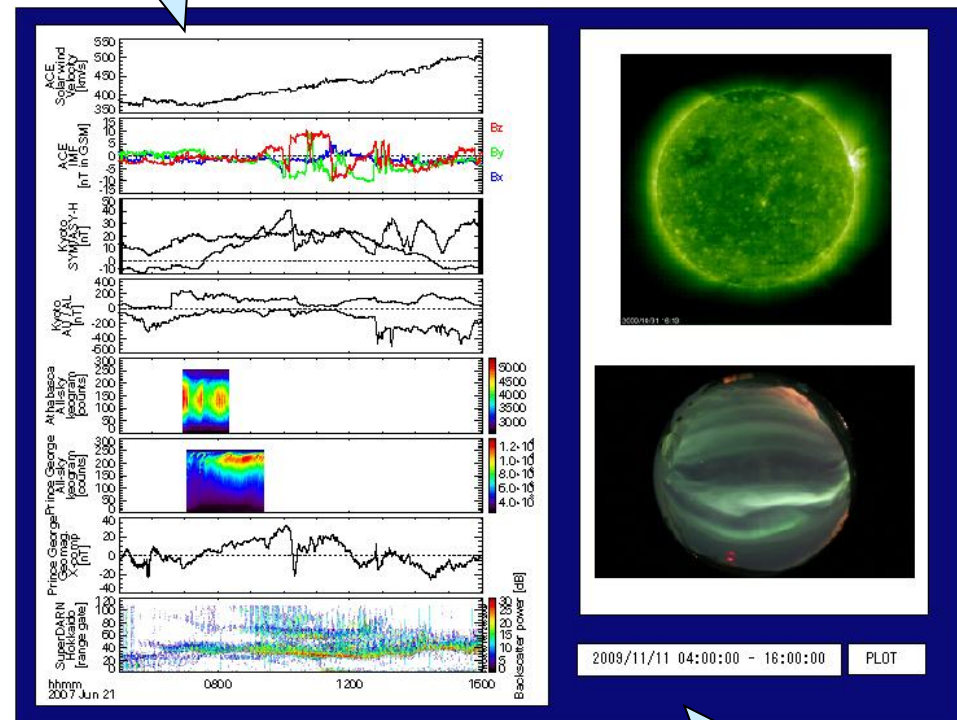
The image shows the 'Search Results' page. At the top, there is a search bar with the text 'Search: All of DSpace'. Below the search bar, there are fields for 'Time from:', 'to', and 'UTC'. There are also checkboxes for search criteria: NumericalData, Catalog, DisplayData, Granule, Repository, Observatory, Instrument, and Person. Below these fields, there is a 'Results/Page' dropdown set to '10' and a 'Sort items by' dropdown set to 'Relevance'. The main part of the page is a table of search results. The table has columns for 'ResourceID', 'Resource Type', 'Description', and 'Association'. The first row is highlighted and has a purple arrow pointing to it from a label 'Metadata list'.

ResourceID	Resource Type	Description	Association
spase://nssdc/nnumericalData/ISEE_00321	NumericalData	ISEE 2 FPE plasma ion parameters 1977-10-26T00:00:00-1980-04-08T00:00:00	-
spase://VHO/NumericalData/WIND/SWE/H5_PT12S	NumericalData	WIND/SWE Electron Quadrature Moments Parameters (12-15s rate) (New Mode) 2002-08-16T00:00:00Z	-
spase://VHO/NumericalData/Ulysses/MAGandPLS/PT1H	NumericalData	Ulysses hourly merged magnetic field and plasma data 1990-10-25T00:00:00-2008-10-	-

- Development of analysis and quick-look software for our observation data has just started, in collaboration with the ERG Science Center.
- The software will be produced with the THEMIS science Data Analysis (TDAS) IDL libraries and be functioned on the free IDL Virtual Machine.

multiple,
“stacked” plots

future image



GUI interface

- The “IUGONET” project will develop a **metadata DB** to facilitate efficient use of the upper atmospheric data, and thereby to promote comprehensive, multi-disciplinary studies.
- Current development status :
 - Metadata DB system is being developed on the basis of **DSpace**.
 - Metadata format has been determined - **SPASE** with some modifications.
 - Analysis software started to be developed with **TDAS IDL** libraries.
- The IUGONET metadata DB will surely contribute to the promotion of international interdisciplinary studies in the **CAWSES-II Escience and informatics group**.

● IUGONET homepage

<http://www.iugonet.org/en>



● JpGU exhibition booth

