IUGONET

The IUGONET project and its international cooperation on development of metadata database for upper atmospheric study

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Experience IUGONET tools at IUGONET Booth!
Research Meeting: 19-21 August, 2013@NIPR (Tokyo)

U-02: Global Data Sciences in the Big Data Era, JpGU Meeting 2013

http://www.iugonet.org/
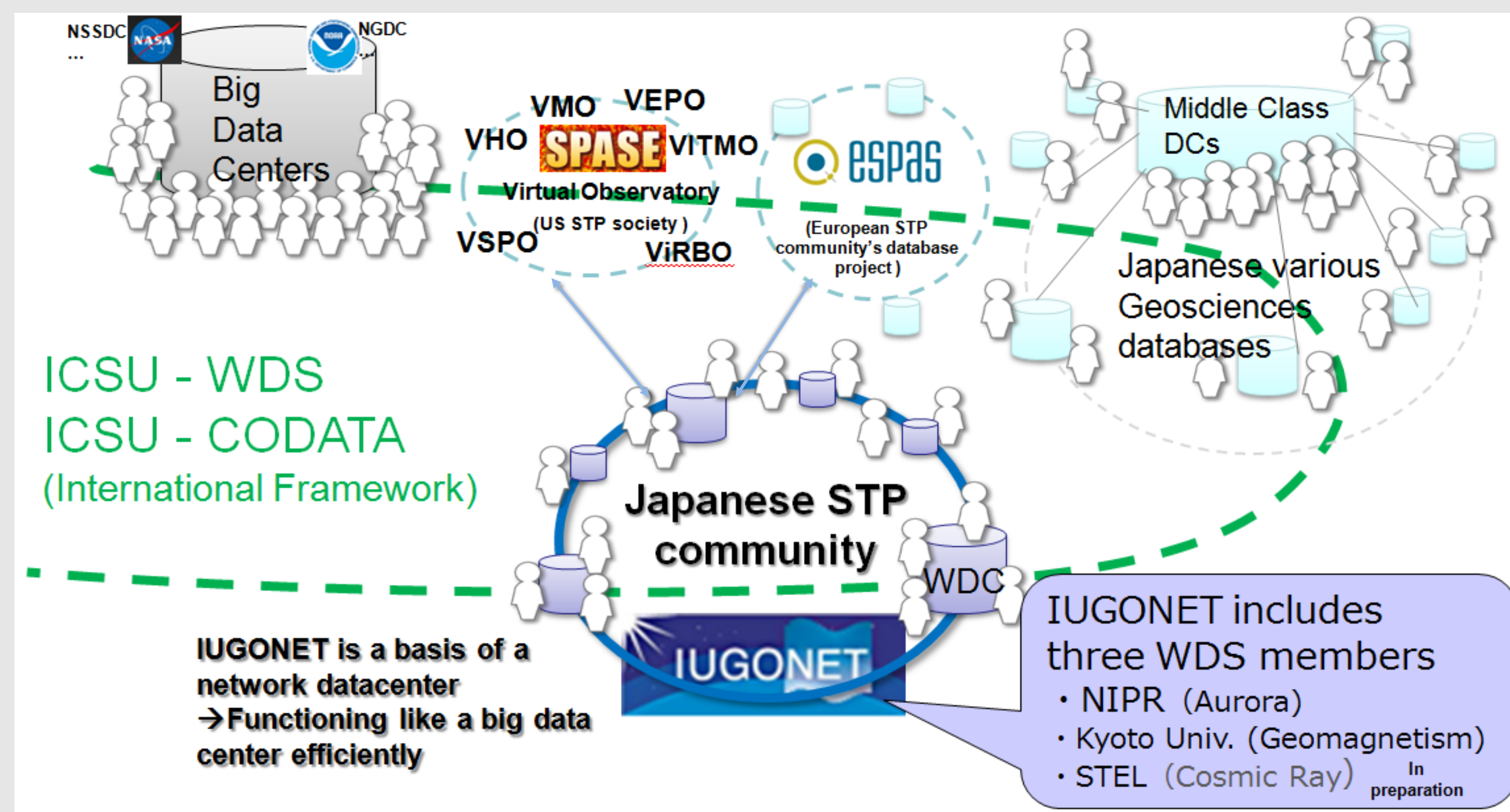
Background of the IUGONET project

▶ Complicated Upper Atmospheric Phenomena
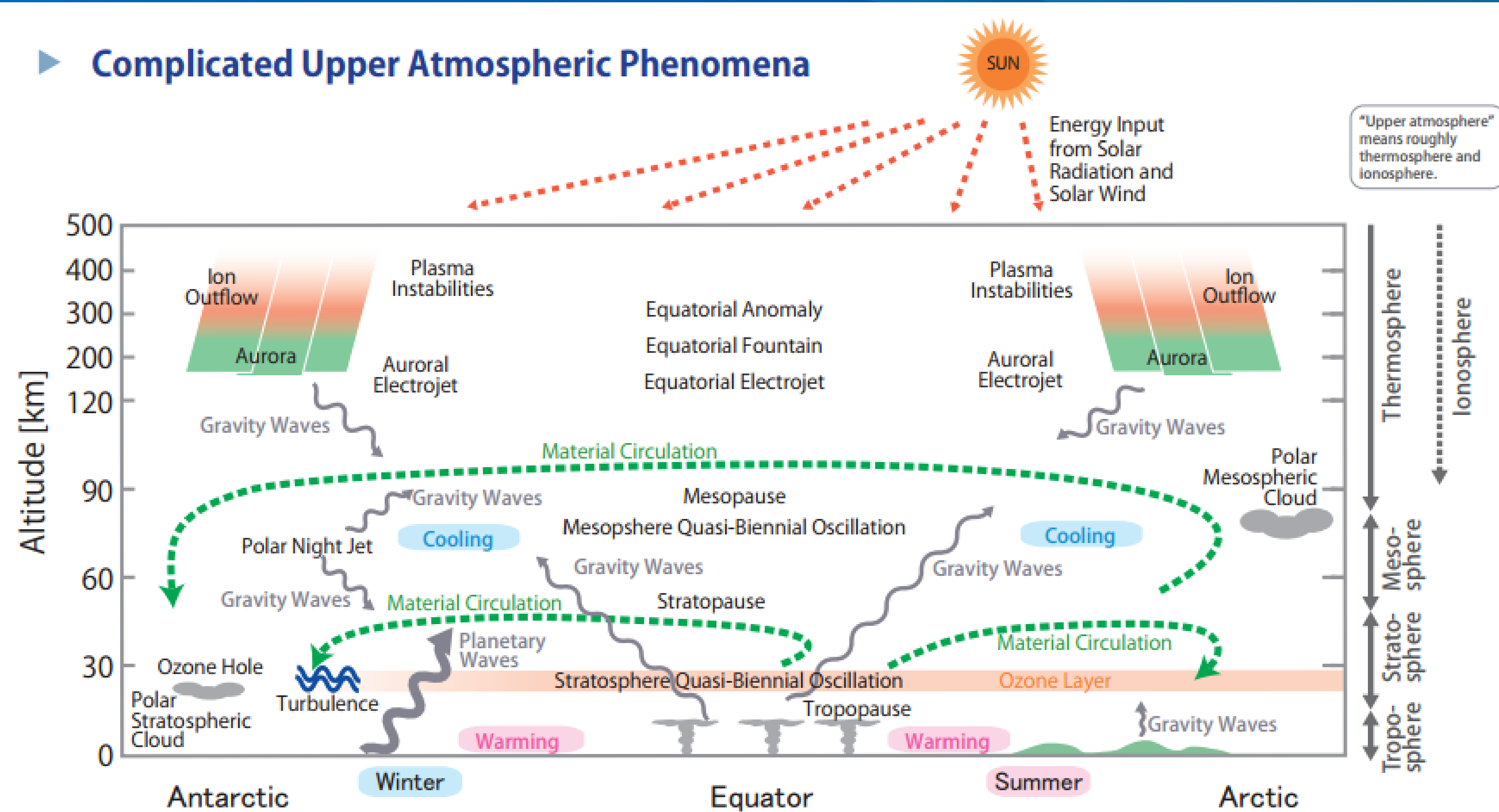
Characters of the variation in the upper atmosphere
1. Affected by various phenomena from the earth surface to the space
2. Many physical parameters
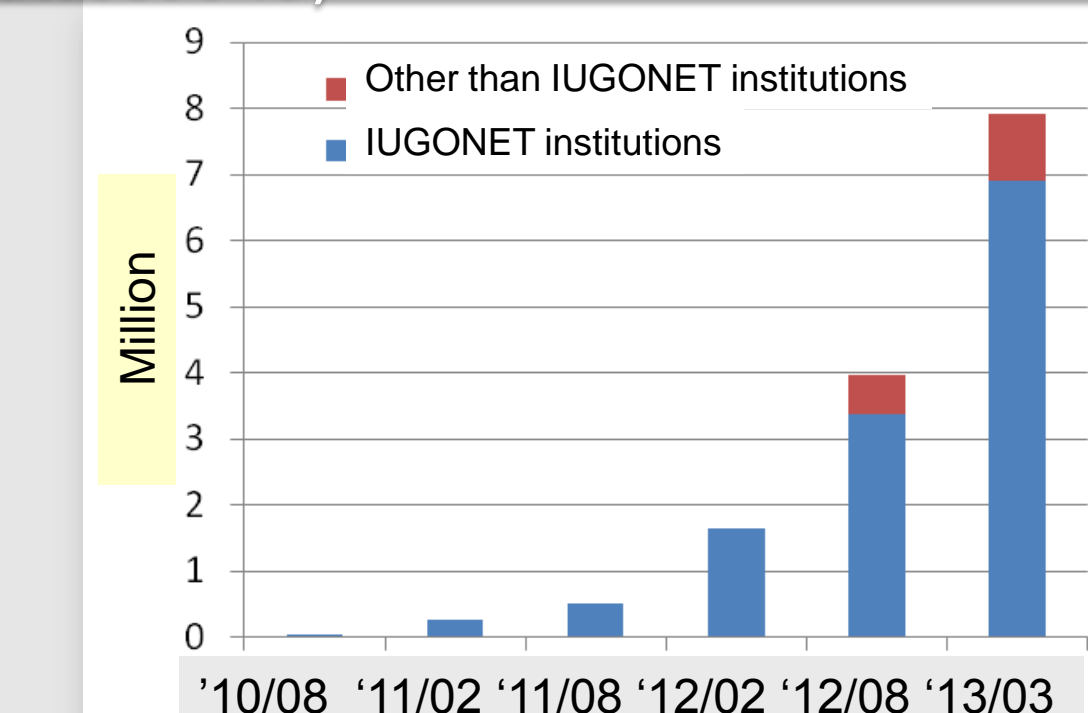3. Various waves including that of solar activity are overlapped

▶ IUGONET Global Network of Ground-Based Observations
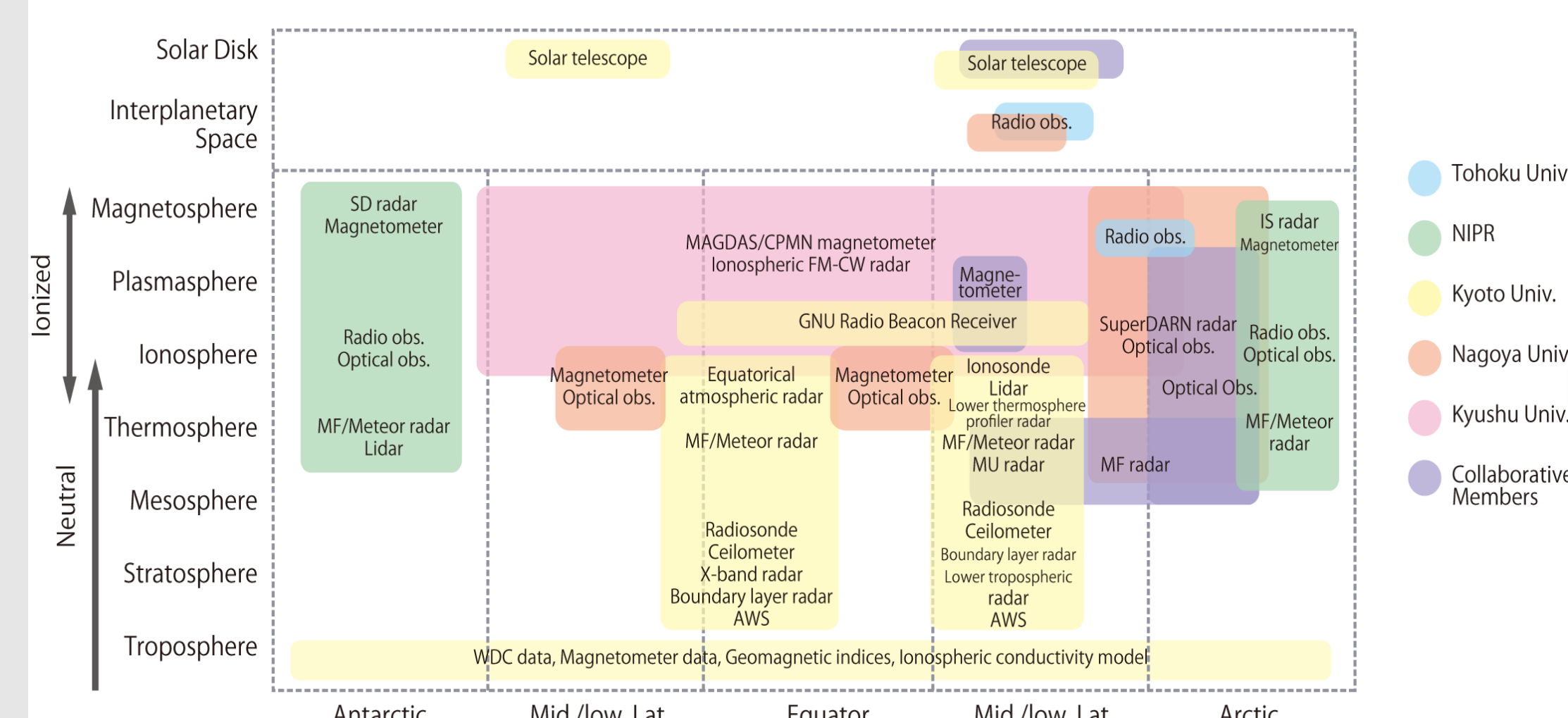
Necessity of a Metadata Database

IUGONET provides a new research platform that enables metadata extracted from ground-based observation data to be shared.
In addition, IUGONET developed analysis software to access and analyze data in an integrated fashion.

Observational data should be quality controlled and managed by the specialists who know the observations.

For users....It was not easy to reach a necessary information, since databases are distributed in various institution.

What is Metadata ?
Metadata are defined as data that describe certain Aspects of information of our data (location, period, Instruments used, data location (URL)).

Observatory | Person | Document | Dataset
Instruments | Catalog | Repository | Granule

Framework of the IUGONET

Steering Committee
International Users
IUGONET Information Center

Kyushu Univ. ICSWSE
Nagoya Univ. STEL
WDC for Cosmic Rays
Tohoku Univ. PPARC
Kyoto Univ. Astronomical Observatories
NIPR
WDC for Aurora
WDC for geomagnetism Space Magnetism
Kyoto Univ. RISH
Kyoto Univ. DACGSM

International/Interdisciplinary linkage

Big Data Centers
Virtual Observatory (US STP society)
VMO VEPO VHO SPASE VITMO VSPO ViRBO
(European STP community's database project)
Middle Class DCs
Japanese various Geosciences databases

ICSU - WDS
ICSU - CODATA
(International Framework)

Japanese STP community
WDC

IUGONET is a basis of a network datacenter
→Functioning like a big data center efficiently

IUGONET includes three WDS members
• NIPR (Aurora)
• Kyoto Univ. (Geomagnetism)
• STEL (Cosmic Ray) In preparation

IUGONET MDDB: what's inside?

Number of Registered data
(as of 17 May 2013)
All: 8,394,891
Except for Granule: 2578
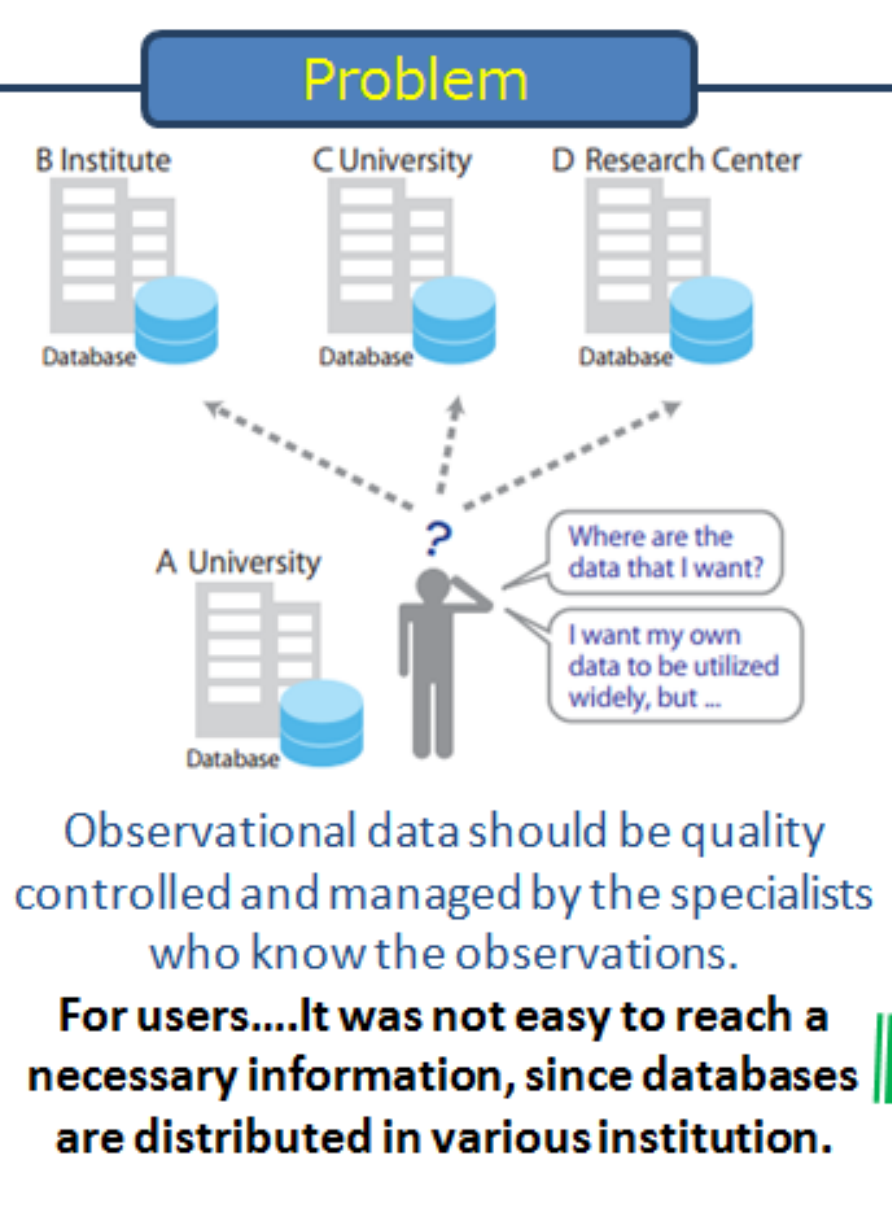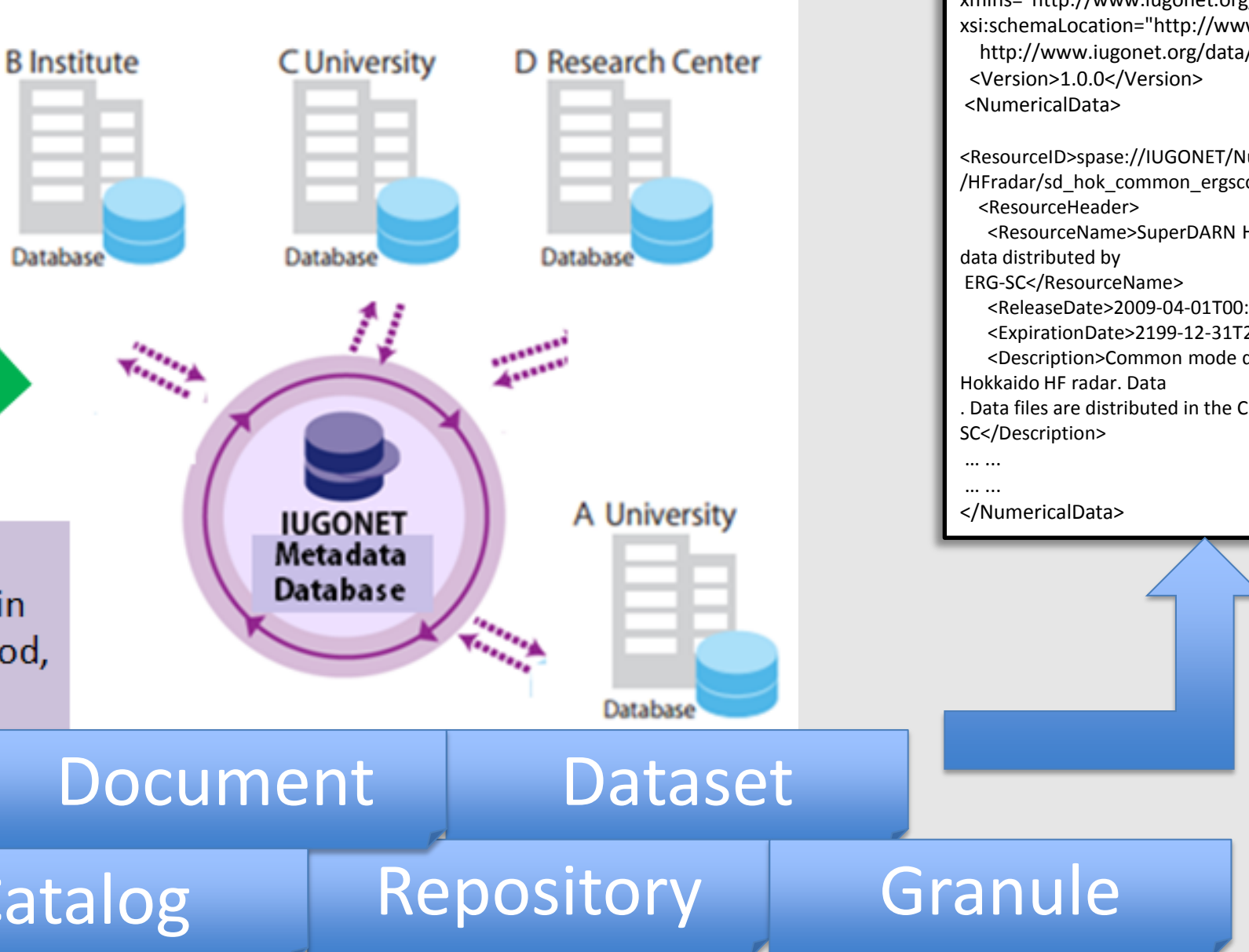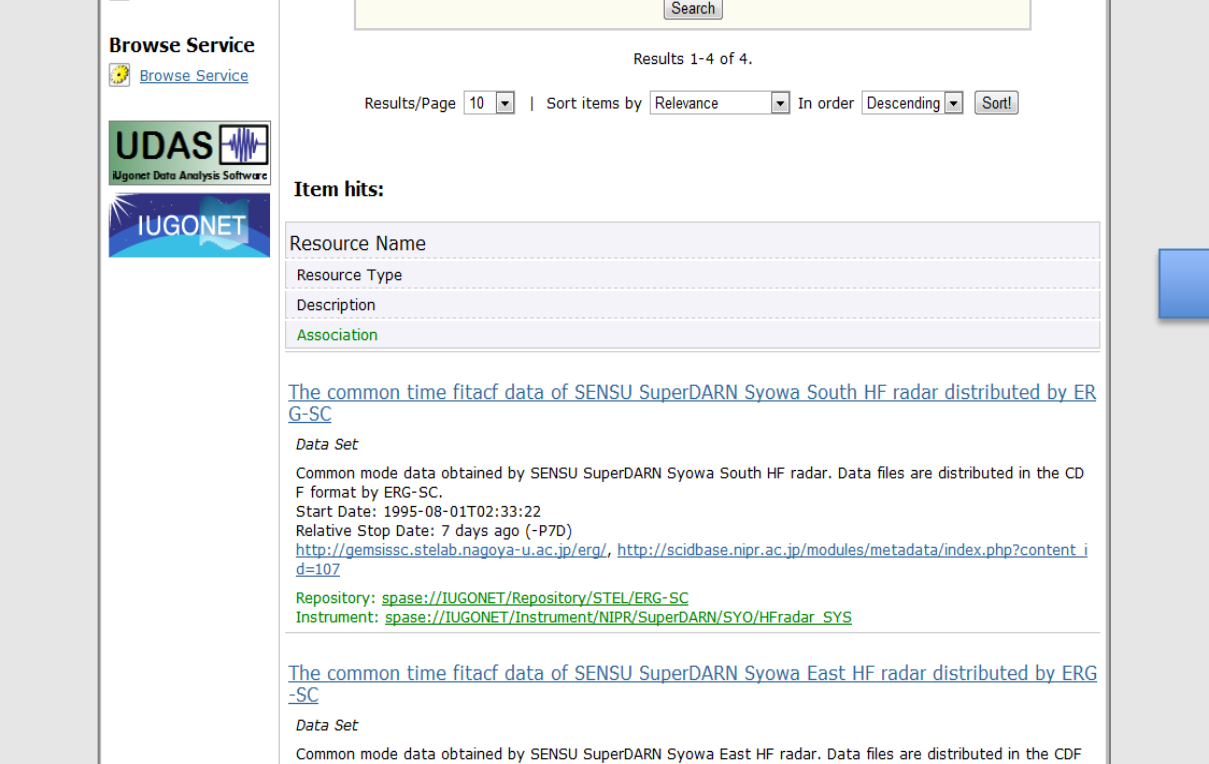(Observatory: 776, Instrument: 869, Dataset 943)

Other than IUGONET institutions
IUGONET institutions
Million
'10/08 '11/02 '11/08 '12/02 '12/08 '13/03

Search Results

Metadata Details

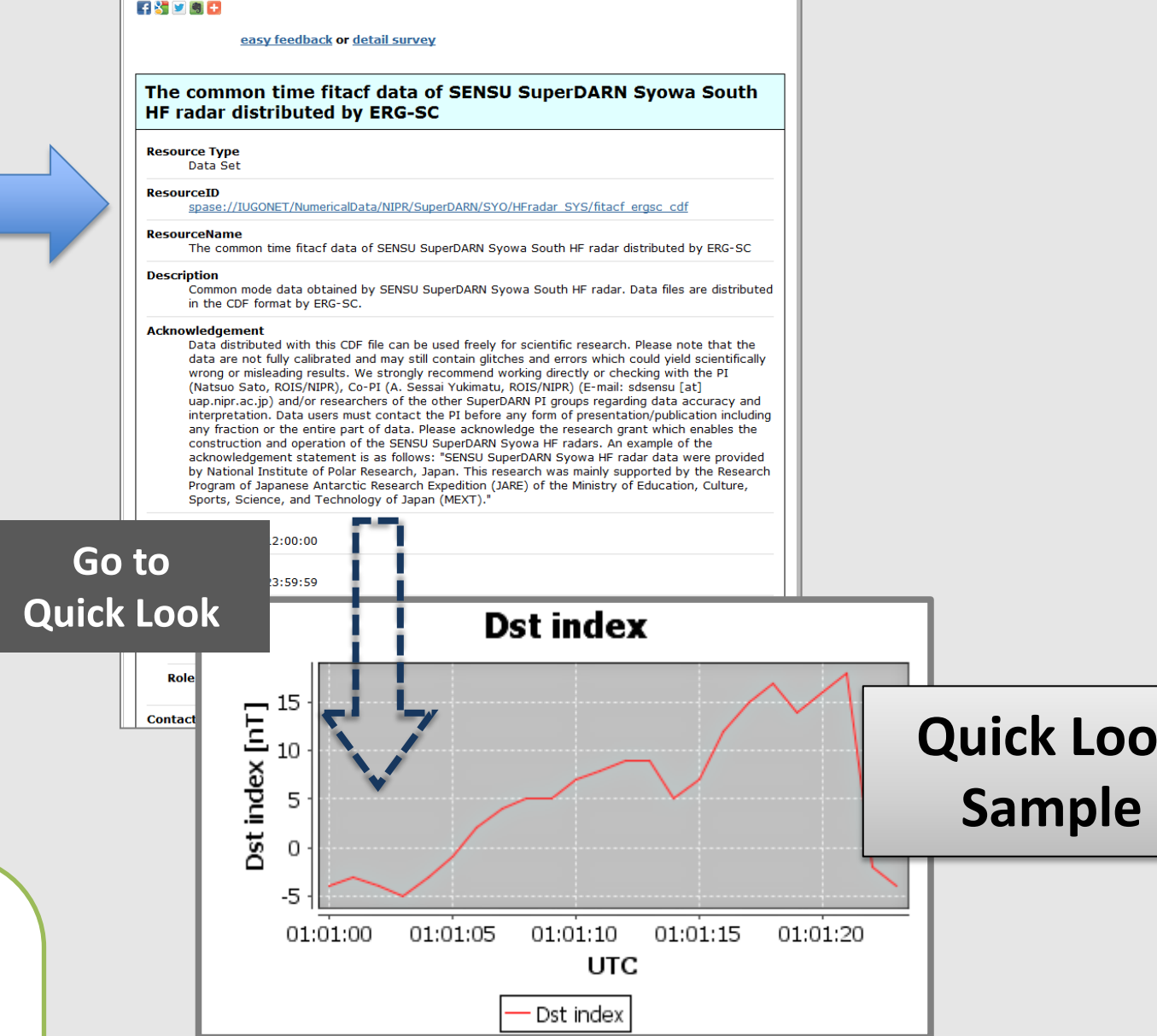Go to Quick Look
Dst index
Quick Look Sample

We are preparing a dictionary which works with "Associative Search" developed by NII.

A quick look (QL) viewer of data referred in the MDDB is under development. The viewer with data can be deployed with a single click over the Internet.
• It has not equipped 2D-plot scheme yet.
• We have checked GeoMapApp.

IUGONET adopted DSpace as the metadata database platform. DSpace is a free software widely used by digital repositories at many universities over the world. One of the major differences between Dublin Core used in the library systems and scientific metadata is the description of domain and period of observation.

IUGONET metadata (XML)

Further developments and international collaborations

SPASE
THEMIS (USA) ERG (Japan)
IUGONET
ESPAS (Europe)
NAOJ, NICT, JMA (Japan)

ESPAS
Near-Earth space data infrastructure for e-Science

Summary

● The IUGONET project has been developing the infrastructures and common tools (metadata database (IUGONET-MDB) and data analysis software (UDAS)) to facilitate the distribution and wide use of the ground-based upper atmospheric data provided by the IUGONET university/institutes.

• IUGONET is continuously in discussion with the SPASE Consortium, since the IUGONET common metadata format is based on the SPASE metadata model. IUGONET is currently discussing the possible international collaboration with the databases of the European project "Near earth space data infrastructure for e-science (ESPAS)" and the "Virtual Observatory (VO)" of the United States.

• In Japan, in addition to the metadata provided by the IUGONET institutions/universities, metadata from the National Astronomical Observatory of Japan (NAOJ), National Institute of Information and Communications Technology (NICT), and the Kakioka Magnetic Observatory of the Japan Meteorological Agency (JMA) have been registered.