

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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MGI031-P01

Room:Convention Hall

Time:May 25 16:15-18:45

Analysis of geomagnetic day-to-day variations by using the Solar Terrestrial Analysis and Reference System (STARS) [1]

Manabu Kunitake^{1*}, Ken T. Murata¹, Tsutomu Nagatsuma¹

¹NICT

Solar-Terrestrial data Analysis and Reference System (STARS) is the system which realizes the crossover search and integrated analyses of ground-based and satellites observations of solar-terrestrial physics. We have implemented new functions concerning geomagnetic data handling and plotting. New functions consist of some pre-processing functions, user-friendly Graphical User Interface (GUI) and well organized plotting functions, for an example, time-shifted overlay plotting.

As an example of the usefulness of the new functions, we show the applying process of the functions to geomagnetic data at many observatories and preliminary results of our analysis of day-to-day geomagnetic variation.

[Acknowledgements]

The results presented in this paper rely on data collected at magnetic observatories. We thank the national institutes that support them and INTERMAGNET for promoting high standards of magnetic observatory practice (www.intermagnet.org).

We thank the World Data Center for Geomagnetism, Kyoto for providing 1-minute digital data from many observatories. We thank the national institutes that support the observatories.

Keywords: geomagnetic variation, day-to-day variation, time-shift, overlay

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MGI031-P02

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Analysis of real-time simulation data of Earth magnetosphere using space weather cloud system

Shinichi Watari^{1*}, Ken Tsubouchi¹, Yasuhiro MORIKAWA¹, Hisao Kato¹, Takashi Tanaka¹, Hiroyuki Shinagawa¹, Ken T. Murata¹

¹NICT

Space Weather Cloud has been constructed in National Institute of Information and Communications Technology (NICT). The Space Weather Cloud contains a high performance computer (NEX SX-8R), distributed mass storage system, and so on. The data obtained by simulation is important to cover geo-space because in-situ data observed by spacecraft are limited. Data from the real-time magnetosphere simulation are stored in the Space Weather Cloud. This enables not only event analysis but also data analysis corresponding to various solar wind conditions.

In the Space Weather Cloud, observation data and simulation data can be handled using the STARS (Solar-Terrestrial data Analysis and Reference System). It is possible to check data using data plots by the STARS.

We will report several examples of analysis using real-time magnetosphere simulation such as variations of geomagnetic field at geostationary orbit.

Keywords: space weather cloud, simulation, magnetosphere

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MGI031-P03

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Metadata database of Virtual Data Center for Earth and Planetary Sciences

Daiki Yoshida^{1*}, Yukinobu Koyama¹, Masahito Nose¹, Toshihiko Iyemori¹

¹WDC for Geomag. Kyoto, Kyoto University

For the promotion of interdisciplinary sciences, a system by which we can locate necessary information without the help by an expert is desirable. To have such system, construction of a metadata database is essential. There exist several international efforts of master directory construction and proposals of standards of metadata format. However, it is not so easy to find necessary information of different fields, and many small databases on research base seem not to be included. We planed to include those datasets and develop a system to find necessary information more easily. In this paper, we will introduce current status of our metadata database.

Keywords: metadata, database, interdisciplinary sciences

MGI031-P04

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Integrated visualization system of spectral data sets of Kaguya

Wataru Kawamae^{1*}, Dang Tuan Anh¹, Shin Sato¹, Kyosuke Isozaki¹, Hirohide Demura¹, Naru Hirata¹, Junya Terazono¹, Noriaki Asada¹

¹Graduate school of Aizu

Spectral observation had been performed by Multi-band Imager (MI) and Spectral Profiler (SP) onboard the Kaguya. MI mapped lunar surface with nine wavelength bands to obtain multi-spectral images. Although SP is not an image sensor, it has high spectral resolution than MI because it observes continuous reflectance spectra from the lunar surface. Data sets of SP can be used to direct mineralogical discrimination/identification of observation points.

Currently, data analysis for MI and SP are conducted separately, but researchers want to retrieve spectral information for both of data sets efficiently to find relationship between the multi-spectral image and the continuous reflectance spectra. However, there is no systematic tool to fill the requirement.

We developed a web system for overlapping visualization of SP data on MI data to solve this situation. With this system, user can browse a map of MI data, select SP's observation displayed on the map, and gets the continuous reflectance spectra of SP data.

The backbone of this system is map creation and transmission mechanism though web with Web-GIS tools provided from Wise-Caps system developed in the university. It provides a platform for data browsing, sharing and analysis. MI ratio images are applied to the frameworks of Wise-Caps system. For overlapping of SP data on MI ratio image, we created a mechanism to visualize the observation points and plot the continuous reflectance spectra from location information of SP observations and SP data sets with Web-GIS tools and some web-based technologies. As observation points of SP amount to tens of missions, we used RDBMS as backend in the system to handle huge data of SP.

User can know mineral composition from the continuous reflectance spectra on interested location that is represented as geological maps of the lunar surface. Comparison of the continuous reflectance spectra between several locations is also available. We will explain overview of this system architecture and Web-GIS framework to implement this system.

Keywords: Kaguya, GIS, Spectra, Database, Visualization

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e-Space Weather: A New Space Weather Web

Ken T. Murata^{1*}

¹NICT

At NICT (National Institute of Information and Communications Technology) we are now developing a new research environment named "OneSpaceNet". The OneSpaceNet is a cloud-computing environment, which connects many researchers with high-speed network (JGN: Japan Gigabit Network). It also provides the researchers rich resources for research studies, such as super-computer, large-scale disk area, licensed applications, database and communication devices. What is amazing is that a user simply prepares a terminal (low-cost PC). After connecting the PC to JGN2plus, the user can make full use of the rich resources via L2 network. Using communication devices, such as video-conference system, streaming and reflector servers, and media-players, the users on the OneSpaceNet can make research communications as if they belong to a same (one) laboratory: they are members of a virtual laboratory.

We present web applications for space weather working on the OneSpaceNet. A variety of web-based services are in progress on the OneSpaceNet. Demonstrations for these web will be at our poster board.

Keywords: NICT, Space Weather, Web Application

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Development of a database system of planetary seismology

Ryuhei Yamada^{1*}, Yukio Yamamoto¹, Jun Kuwamura², Yoshio Nakamura³

¹Japan Aerospace Exploration Agency, ²Japan PostgreSQL User Group, ³The University of Texas

From 1969 to 1972, first seismic network except the Earth had been deployed on the Moon in NASA Apollo program. The seismic observation on the Moon has been continued until September, 1977, and the real-time seismic data have been sent to ground-based stations. The observed data was processed and archived in magnetic tapes at NASA Johnson Space Center and The University of Texas Institute for Geophysics (UTIG). Then, the archived data was moved to 8-mm video cassette tapes and computer hard-disk drive for long storage and data analysis by UTIG and Institute of Space and Astronautical Science (ISAS) during 1990's. Currently, these digital-data is archived and opened to the public in NASA National Space Science Data Center (NSSDC) and Incorporated Research Institutions for Seismology (IRIS).

However, since these opened data is archived with original format and the status information of the observation is not archived together, the public users are hard to process the archived data. For the reason, we are developing a new database system to archive all of planetary seismic data with the status information, the characteristics of the seismometers and parts of current results of the data analysis in ISAS. In this database, all digital data is archived with ASCII format, and the users may convert the format to general ones for the seismic study such as SEED, WIN and SAC formats. Our archived data will be opened to Web system, and the users will be able to download the required data using graphical interface on the Web browser. We can compare between the observed waveform and the engineering data of the seismometers in same time series using this interface system.

Our database system includes the active seismic data performed by the astronauts at 1971 and 1972 and the passive listening data observed by the seismometers used for the active seismic experiment from 1976 to 1977, not only the passive seismic data from 1969 to 1977. In these seismic data, many lunar seismic events are included and they are identified and cataloged by (Nakamura, 2008) even now. We are creating a system to search, display and download the required lunar seismic events using information on (Nakamura, 2008). Then, the Martian seismic data observed by the seismometer deployed on Mars from 1976 to 1978 is decoded and archived in our database now to aggregate all of planetary seismic data in our system.

The archived seismic data remain a matter of analysis since their initial analysis. If we use current analysis technique and computer processing ability, we can expect that new important scientific results will be discovered. In addition, we will obtain the useful information for future lunar and Martian seismic experiments by comparing the seismic data with the engineering data and the other geophysical data, which observe the surrounding environment near the seismometers. In this presentation, I will report the overview and current status of the database system and the plan of data analysis using our database.

Keywords: Planetary Seismology, Data Base, Data Archiving, Moonquake, Mars quake, Planetary Seismic Exploration

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International Programme Office of ICSU World Data System and NICT geophysics databases

Yasuhiro Murayama^{1*}, Ken T. Murata¹, Mamoru Ishii¹, Narihisa Doi², Shuichi Iwata³, Takashi Watanabe³, Toshihiko Iyemori⁴, Hideki Kashioka¹, Toshio Iguchi¹, Hiroshi Kumagai¹

¹Natl. Inst. of Info. Communications Tech., ²Keio University, ³Nagoya University, ⁴Kyoto University

Establishment of World Data System (WDS) of ICSU (International Council for Science) was decided at the ICSU General Assembly in 2008. The WDS was discussed in context of existing stand-alone WDCs (World Data Centers) and individual FAGS (Federation of Astronomical and Geophysical data-analysis Services) services, and now, its concept is to incorporate WDS facilities which ICSU-WDS is open for, and is to review, proposals from data centers, data archives, data services who wish to join the WDS system. The new system aims at creation of a common globally interoperable distributed data system, or a system of data systems, incorporating emerging technologies and new scientific data activities. WDS is designed to set up the WDS International Programme Office (WDS-IPO).

NICT (National Institute of Information and Communications Technology) of Japan submitted a proposal that NICT will host IPO, and the ICSU Executive Board decided to accept the offer at its meeting (29-30 October 2010). The WDS-IPO will manage and coordinate the establishment and operations of the WDS, and take responsibility for outreach and promotion activities. The IPO will act under the guidance of the ICSU World Data System Scientific Committee.

Keywords: ICSU, WDC, WDS, science information, data