

A view of International Landscape of Open Science and Research Data Sharing

*村山 泰啓¹

*Yasuhiro Murayama¹

1. 国立研究開発法人情報通信研究機構統合ビッグデータ研究センター

1. Big Data Integration Research Center, National Institute of Information and Communications Technology

Since the G8 Science Ministers' Meeting in UK 2013, Open Science policy and practice have been intensively discussed in related countries. Many bodies have been committing this activity like academic committees ICSU-World Data System (WDS) and Committee of Science and Technology Data (CODATA), RDA (Research Data Alliance), a data consortium in connection to G8 Group of Senior Officials (GSO)'s data infrastructure working group, and recently OECD (Organization of Economic Cooperation and Development) Global Science Forum, etc. In Japan, Cabinet Office of Japan played a leading role in Japan to publish the first national guiding principle of Open Science for Japan (March 2015). In 2016 G7 Science and Technology Ministers' Meeting was held in Japan, including the Open Science session as one of its six main themes.

Open Science is rapidly becoming an important focus of international discussions for its possible big impacts on scientific research, and also citizen, the Society and its economy. Recognising our scientific knowledge basis accumulated on "print technology" basis (books, articles) for more than 300 years, advantage of digital technology and electronic information and communication (ICT) infrastructure is emphasized in terms of high-speed and huge-volume data processing although it has only a 70-year history. Accessibility, sharing, interoperability of data and infrastructure, citability, and reuse are important prerequisites. Regardless of the open or closed policy, the capacity to assess trustworthiness of datasets, to preserve and manage them in an organized way, and to enable professional and non-professional reuse to create new knowledge are important in the context of Open Science.

Long-term preservation of digital data raises questions such as the size of data we should preserve, the preservation period (50-100 years similar to academic articles?), the increasing costs of bigger size of data (at present), and so on. In the scientific research data area, an international enterprise, the World Data Centres, was established by the International Council for Science (ICSU) in 1957-58 to exchange and store important scientific data as data books and microfilms. With the unprecedented technical infrastructure available today over the world and the need for multidisciplinary data integration to solve the most pressing challenges facing humanity, ICSU decided to form the new ICSU-World Data System (WDS) in 2008 based on the strong legacy of its two data organizations in past. The International Programme Office of WDS is now hosted by NICT in Japan, Tokyo. WDS works with its member organizations—holders and providers of data—to secure trustworthy, sustainable and findable data archives.

Libraries in past have been based on the print technology mostly. They selected books, improved preservation, and built the international network of exchange and copy of books. We are now on the starting line to construct a similar infrastructure for electronic data resources in academic fields. These efforts to support and promote best practices, will lead to building a new layer on top of the current ICT technology layers. This change has potential to lead to wide reuse of datasets with greater interoperability. Experiences and best practices in past academia are indispensable important legacy for

us to help designing a new academic information infrastructure in this new era.

キーワード：オープンサイエンス、データ共有、科学データオープン化

Keywords: Open Science, Data Sharing, Open Science Data

Challenges and Motivations for International Coordination of Open Science Data Infrastructures

*Mustapha Mokrane¹

1. ICSU World Data System

Modern scientific research is an increasingly global endeavour and sharing common resources and instruments is becoming the norm. Scientific progress is built on the exchange of knowledge and practice—literature, data, and other research artefacts—amongst researchers in the scientific community. Data are widely recognized as a foundational and essential element of research and their availability, sharing and reuse are at the core of the Open Science paradigm.

Scientific communities have long come together to coordinate their research activities internationally including the management and stewardship of data. Taking advantage of the new information and communication technologies, they also enabled the physical networking of research data infrastructures which led to the emergence of large-scale regional and global research data infrastructures supporting science. These global data infrastructures became a reality in pioneering research domains such as astronomy, genomics, and Earth sciences resulting in more efficient research and revolutionizing the conduct of research.

However, these international networks face many challenges because they cut across national boundaries, (scientific) cultures, and sometimes disciplines. Their success is heavily dependent on the convergence and synergies between diverse national (data) policies and funding schemes. Furthermore, these international networks are largely focussing and serving specific domains, thus re-creating silos of data infrastructures when the challenges facing society require multi- and transdisciplinary data infrastructures.

This presentation will review several exemplars in the Earth and Space sciences, analyze common practices and approaches to derive lessons learnt and identify key issues that require policy actions, and the types of actions that might be appropriate.

Keywords: Global Data Infrastructure, Open Science, International Coordination

Recent activity of DOI-minting to solar-terrestrial physics data

*能勢 正仁¹、村山 泰啓²、木下 武也³、小山 幸伸⁴、西岡 未知⁵、石井 守⁵、国武 学²、今井 弘二²、家森 俊彦¹、渡邊 堯⁶

*Masahito Nose¹, Yasuhiro Murayama², Takenari Kinoshita³, Yukinobu Koyama⁴, Michi Nishioka⁵, Mamoru Ishii⁵, Manabu Kunitake², Koji Imai², Toshihiko Iyemori¹, Takashi Watanabe⁶

1. 京都大学大学院理学研究科、2. 情報通信研究機構 統合データシステム研究開発室、3. 海洋研究開発機構、4. 大分工業高等専門学校、5. 情報通信研究機構 電離圏・宇宙天気世界資料センター、6. 情報通信研究機構 WDS国際プログラムオフィス

1. Graduate School of Science, Kyoto University, 2. Integrated Science Data System Research Laboratory, National Institute for Information Communications Technology, 3. Japan Agency for Marine-Earth Science and Technology, 4. Oita National College of Technology, 5. World Data Center for Ionosphere and Space Weather, National Institute for Information Communications Technology, 6. World Data System-International Program Office/National Institute for Information Communications Technology

Data-DOI, data publication, and data citation will promote "Open Science". Recognizing their importance, solar-terrestrial physics (STP) data centers in Japan have been working to mint DOI to their database. We participated from October 2014 in a 1-year pilot program for DOI-minting to science data launched by Japan Link Center, which is one of the DOI registration agencies. In the pilot program, a procedure of the DOI-minting for STP data was established. As a result of close collaboration with Japan Link Center, the first case of data-DOI in Japan (doi:10.17591/55838dbd6c0ad) was created in June 2015. The first case of data citation in Japan was also made. As of February 2017, there are 16 data-DOIs for the STP data in Japan. In the International Association of Geomagnetism and Aeronomy (IAGA), STP domain scientists who are working for data centers or observatories started discussion about DOI-minting to their data and a task force was formed in August 2013. The next IAGA (joint) assembly that will be held at Cape Town in August 2017 provides a special session entitled "The referencing of geophysical data products: The role of DOIs". The international effort will be continued for DOI-minting to scientific data in STP.

Toward Open and Beyond! Sharing Data in the Earth Sciences

*Kerstin Lehnert¹, Brooks Hanson²

1. Lamont-Doherty Earth Observatory, Columbia University, 2. American Geophysical Union

The paradigm of Open Science is recognized as a powerful and essential catalyst for the advancement of science in the 21st century, and as a necessary and guiding principle for the integrity and validity of research to ensure trust in the scientific process and its results. One of the primary requirements of Open Science is the open sharing of data, code, and other research materials on a global scale. This is especially relevant in the Earth Sciences, where urgent societal problems such as climate variability, effective prediction of natural hazards, and sustainable management of the natural resources cannot be answered with locally constrained datasets and where society must have confidence in the basis for impacts and decisions that can have large economic and societal effects. Over the past few years, publishers, repositories, and funders have developed a number of best practices around presenting, linking, and curating these related research products. Our presentation will focus on these best practices for sharing data, code, and samples and on developing the broader infrastructure that can support such data sharing in a sustainable manner. We will report on progress made in the Earth Sciences over recent years towards the open sharing of data in the Earth Sciences, reporting on US-based and international initiatives such as EarthCube and COPDESS. We argue that the concept of 'open' is not a sufficient and adequate goal; instead open data must be FAIR –findable, accessible, interoperable, and re-usable. This requires additional support by the community so that data can be explored and interpreted with confidence and in new multi-disciplinary perspectives.

Keywords: Open science, Data sharing, Research infrastructure

Development status of the metadata server and data archives at Tohoku University for collaborative studies using planetary radio and spectroscopic data

*熊本 篤志¹、土屋 史紀²、三澤 浩昭²、鍵谷 将人²、北 元¹、木村 智樹³、埜 千尋⁴、今井 一雅⁵、中城 智之⁶、Cecconi Baptiste⁷

*Atsushi Kumamoto¹, Fuminori Tsuchiya², Hiroaki Misawa², Masato Kagitani², Hajime Kita¹, Tomoki Kimura³, Chihiro Tao⁴, Kazumasa Imai⁵, Tomoyuki Nakajo⁶, Baptiste Cecconi⁷

1. 東北大学大学院理学研究科地球物理学専攻、2. 東北大学大学院理学研究科惑星プラズマ・大気研究センター、3. 国立研究開発法人理化学研究所仁科加速器研究センター、4. 情報通信研究機構、5. 高知工業高等専門学校電気情報工学科、6. 福井工業大学電気電子情報工学科、7. LESIA, Observatoire de Paris, CNRS, PSL Research University

1. Department of Geophysics, Graduate School of Science, Tohoku University, 2. Planetary Plasma and Atmospheric Research Center, 3. Nishina-Center for Accelerator Based Science, RIKEN, 4. National Institute of Information and Communications Technology, 5. Department of Electrical Engineering and Information Science, Kochi National College of Technology, 6. Department of Electrical, Electronics, and Computer Engineering, Fukui University of Technology, 7. LESIA, Observatoire de Paris, CNRS, PSL Research University

Data archive of Jovian radio emissions in decametric wavelength range (DAM, 20-40 MHz) measured at ground stations of Tohoku University was started in 2004. Metadata services for IUGONET (Inter-university Upper atmosphere Global Observation NETwork, supported by the Special Educational Research Budget, and the Special Budget Project from MEXT (the Ministry of Education, Culture, Sports, Science and Technology), Japan in 2009-2014) and EuroPlanet/VESPA (Virtual European Solar and Planetary access) were also started in 2009 and 2015 in collaboration with IUGONET-member organizations, and Paris Observatory team. In 2016, we developed data archives of solar radio waves in VHF/UHF range obtained by IPRT (litate planetary radio telescope), and planetary spectroscopic data obtained by Hisaki spacecraft, and started providing their metadata for VESPA with support of JSPS France-Japan Bilateral Joint Research Program "Coordinated observational and theoretical researches for Jovian and Kronian auroral radio emissions". We are planning to add metadata of Jovian radio wave data from observatories of Kochi National College of Technology, and Fukui University of Technology, planetary spectroscopic data from Tohoku University observatories in Hawaii, and solar wind parameters from Tao's model.

Ground-based observations with multi-longitudinal stations enable us 24-hour continuous track of the activity variation of the Jovian auroral radio emissions. By using Spectrograms of Jovian decametric radiation obtained at Nancay and litate observatories, and spectroscopic data from Hisaki spacecraft, we are performing analyses of the effects of the Io's volcanic activity in 2015 on the occurrence timing of the arc structures in the spectrogram of Jovian decametric radiations. Source identification method of the Jovian decametric radiation was developed based on Nancay data [Marques et al., 2016]. We are going to apply the method to dataset including litate data, and utilize for statistical analyses. Another merit of the ground-based observations is that we can use facilities such as large antenna array, high time/frequency resolution receivers, high-speed networks, and large amount storages, which are difficult to use in the spacecraft observations. We participate Juno ground support team and exchange the information on support observation schedules.

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キーワード：木星デカメータ電波、IUGONET、Europlanet/VESPA

Keywords: Jovian DAM, IUGONET, Europlanet/VESPA

Science Services: Examples of Opening Research Data to the Scientific Ocean Drilling Community and General Public

*Sean Toczko^{1,2}

1. Japan Agency for Marine-Earth Science and Technology, 2. Center for Deep Earth Exploration

The IODP is a wildly successful example of a long-term, international, collaborative science research program. Once solely managed by a US consortium, operating one ship, it now includes three international agencies/science operators working together, each operating/contracting their own vessels. The data and samples resulting from these collaborative efforts now reside in three regional core repositories, with each region also operating its own database. While standards and policies regarding the treatment of data and samples are extremely mature, each region has approached data management differently.

With the recent momentum behind open data and open access to science data and samples resulting from public investment increasing, it's important to ensure that these important scientific ocean drilling resources are readily available to the science community and the general public.

I examine the current status of each drilling database, and discuss the efforts to improve data services among the three science operators.

Keywords: scientific ocean drilling, international ocean discovery program, open data

Digital Typhoon and open science - a trans-disciplinary platform for typhoon-related data

*北本 朝展¹

*Asanobu Kitamoto¹

1. 国立情報学研究所

1. National Institute of Informatics

Digital Typhoon is a transdisciplinary platform for typhoon-related data. It is the database of not only research data, but also society and citizen derived data such as news text and social media. It covers not only current data, but also past data to make comprehensive data archives, such as 40 years of satellite and ground observation data and 100 years of weather chart data. A variety of typhoon-related data is not only stored in silos, but also linked with other data across domains, and indexed using data-driven algorithms to make them findable. In short, Digital Typhoon offers the collection of best practices about how data can be integrated and indexed to make them findable, accessible, interoperable and reusable (FAIR). As a result, Digital Typhoon has been used not only by scientists but also by citizens for a variety of purposes such as for research, work, and hobby, with annual page views of 10 to 20 million for more than 10 years since 2003. In the context of Open Science, we share our experience on more than 10 years of operating this platform, and our challenges to make this platform sustainable against internal and external problems.

キーワード：台風、デジタル台風、オープンサイエンス、超学際的プラットフォーム、コミュニケーション、気象

Keywords: typhoon, Digital Typhoon, open science, transdisciplinary platform, communication, meteorology

VESPA: a community-driven Virtual Observatory in Planetary Science

Stéphane Erard¹, *Baptiste Cecconi¹, Pierre Lesidaner², Angelo P Rossi³, Maria Teresa Capria⁴, Bernard Schmitt⁵, Vincent Genot⁶, Nicolas Andre⁶, Ann Carine Vandaele⁷, Manuel Scherf⁸, Ricardo Hueso⁹, Anni Määttä¹⁰, William Thuillot¹¹, Benoit Carry¹¹, Nicholas Achilleos¹², Chiara Marmo¹³, Ondrej Santolik¹⁴, Kevin Benson¹², Pierre Fernique¹⁵, Laurent Beigbeder¹⁶, Ehouarn Millour¹⁷, Batiste Rousseau¹, Francois Andrieu¹, Cyril Chauvin², Mikhail Minin³, Stavro Ivanovski⁴, Andrea Longobardo⁴, Philippe Bollard⁵, Damien Albert⁵, Michel Gangloff⁶, Nathanael Jourdan⁶, Myriam Bouchemit⁶, Jean-Michel Glorian⁶, Loic Trompet⁷, Tarek Al-Ubaidi⁸, Jon Juaristi Campillo⁹, Josselin Desmars¹¹, Patrick Guio¹², Omar Delaa¹³, Anthony Lagain¹³, Jan Soucek¹⁴, David Pisa¹⁴

1. LESIA, Observatoire de Paris, CNRS, PSL Research University, Meudon, France, 2. DIO-PADC, Observatoire de Paris, CNRS, PSL Research University, Paris, France, 3. Jacobs University, Bremen, Germany, 4. IAPS, INAF, Rome, Italy, 5. IPAG UGA/CNRS, Grenoble, France, 6. IRAP, Université Paul Sabatier, CNRS, Toulouse, France, 7. IASB/BIRA, Brussels, Belgium, 8. IWF, OeAW, Graz, Austria, 9. ETSI/UPV/EHU, Bilbao, Spain, 10. LATMOS/IPSL, UVSQ, Université Paris-Saclay, UPMC Univ. Paris 06, CNRS, Guyancourt, France, 11. IMCCE, Observatoire de Paris, PSL Research University, CNRS, Paris, France, 12. University College London, London, UK, 13. GEOPS, CNRS, Université Paris Saclay, Orsay, France, 14. Institute of Atmospheric Physics, Czech Academy of Sciences, Prague, Czech Republic, 15. Observatoire astronomique de Strasbourg, Université de Strasbourg, UMR 7550, France, 16. GFI, Toulouse, France, 17. LMD / IPSL, CNRS, Paris, France

The VESPA data access system is intended to apply Virtual Observatory standards and tools to Planetary Science. Building on a previous EU-funded Europlanet program, it has reached maturity during the first year of a new Europlanet 2020 program (started in 2015 for 4 years). The infrastructure has been upgraded to handle many fields of Solar System studies, with a focus both on users and data providers. This paper describes the broad lines of the current VESPA infrastructure as seen by a potential user, and provides examples of real use cases in several thematic areas, together with hints for future developments.

Keywords: Virtual Observatory, Solar System, GIS

System architecture enabling runs on request for a Transplanet model of magnetosphere-ionosphere coupling at Earth, Mars, and Jupiter

Antoine Goutenoir¹, Mikel Indurain¹, Myriam Bouchemit¹, Pierre-Louis Blelly¹, Aurélie Marchaudon¹, *Nicolas Andre¹, Vincent Génot¹

1. Institut de Recherche en Astrophysique et Planétologie, CNRS-UPS, Toulouse, France

Under Horizon 2020, the Europlanet 2020 Research Infrastructure (EPN2020-RI, <http://www.europlanet-2020-ri.eu>) includes an entirely new Virtual Access Service, “Planetary Space Weather Services” (PSWS) that will extend the concepts of space weather and space situational awareness to other planets in our Solar System and in particular to spacecraft that voyage through it. PSWS will provide at the end of 2017 12 services distributed over 4 different service domains –1) Prediction, 2) Detection, 3) Modelling, 4) Alerts. These services include in particular a Transplanet model of magnetosphere-ionosphere coupling at Earth, Mars, and Jupiter that enable the users to made runs on request of the model, archive and/or connect the results of their simulation runs to various tools developed in the Virtual Observatory. The present paper will first describe the Transplanet model, and then present the system architecture developed by the Space Plasma Physics Data Center (<http://www.cdpp.eu>) in France in order to make the service operational (<http://transplanet.irap.omp.eu>). Europlanet 2020 RI has received funding from the European Union’ s Horizon 2020 research and innovation programme under grant agreement No 654208.

Keywords: Planets, magnetosphere, ionosphere, runs on request, Virtual Observatory, Data archive

Recent science developments of the French Plasma Physics Data Centre (CDPP)

*vincent genot¹, nicolas dufourg², myriam bouchemit¹, baptiste cecconi³, nicolas andré¹, christian jacquey¹, frederic pitout¹, michel gangloff¹, nathanael jourdane¹, joelle durand², alexis rouillard¹, antoine goutenoir¹, elena budnik¹, mikel indurain¹

1. IRAP, CNRS & UPS, 2. CNES, 3. LESIA, Observatoire de Paris

The French Plasma Physics Data Centre (CDPP, <http://www.cdpp.eu/>) addresses for nearly 20 years all issues pertaining to natural plasma data distribution and valorization. Initially established by CNES and CNRS on the ground of a solid data archive, CDPP activities diversified with the advent of broader networks and interoperability standards, and through fruitful collaborations (e.g. with NASA/PDS): providing access to remote data, designing and building science driven analysis tools then became at the forefront of CDPP development. Today the CDPP tool AMDA helps scientists all over the world accessing and analyzing data from ancient to very recent missions (from Voyager, Galileo, Giotto, ... to Maven, Rosetta, MMS, ...) as well as results from models and numerical simulations. Other tools like the Propagation Tool or 3DView allow users to put their data in context and interconnect with other databases (CDAWeb, MEDOC) and tools (Topcat). This presentation will briefly review this evolution and demonstrate technical and science use cases. The presentation will ultimately show how CDPP activities will serve future missions (BepiColombo, Solar Orbiter, THOR, ...).

Keywords: data centre, analysis tool, archive, plasma data

Arctic Data archive System(ADS)

*矢吹 裕伯¹、杉村 剛¹、照井 健志¹

*Hironori Yabuki¹, Takeshi Sugimura¹, Takeshi Terui¹

1. 大学共同利用機構法人情報・システム研究機構国立極地研究所

1. National Institute of Polar Research

A new project of the Arctic research (ArCS :Arctic Challenge for Sustainability) has been started in 2015. ArCS is a national flagship project funded by the Ministry of Education, Culture, Sports, Science and Technology. The National Institute of Polar Research (NIPR), Japan Agency for Marine-Earth Science and Technology (JAMSTEC) and Hokkaido University are playing the key roles in this project, and will continue to carry it out for approximately four-and-a-half years from September 2015 to March 2020. Arctic Data archive System (ADS) is responsible for the data management of this project.

Arctic Data archive System (ADS), to promote the mutual use of the data across a multi-disciplinary to collect and share data sets, such as observational data, satellite data, and numerical experiment data. Through these data sets, clarify of actual conditions and processes of climate change on the Arctic region, and further contribute to assessment of the impact of global warming in the Arctic environmental change, to improve the future prediction accuracy.

キーワード：北極域、温暖化、ArCS

Keywords: Arctic, Global Warming, ArCS

DIASメタデータ入力キャンプにおけるオープンサイエンス活動 DIAS metadata input camp as an Open Science activity

*絹谷 弘子¹、中原 陽子²、清水 敏之²、吉川 正俊²

*Hiroko Kinutani¹, Yoko Nakahara², Toshiyuki Shimizu², Masatoshi Yoshikawa²

1. 東京大学地球観測データ統合連携研究機構、2. 京都大学大学院情報学研究科

1. Earth Observation Data Integration and Fusion Research Institute, The University of Tokyo, 2. Graduate School of Informatics, Kyoto University

The Data Integration and Analysis System (DIAS) started from 2006. The goals of DIAS are to collect and store earth observation data; to analyze such data in combination with socio-economic data, and convert data into information useful for crisis management with respect to global-scale environmental disasters, and other threats; and to make this information available within Japan and overseas. The current project of phase III has started since 2016 with the aim of its practical operation.

From October 2010, we have released data of DIAS with Document-metadata, describing about dataset in English and Japanese. DIAS has a mission to accelerate the accessibility of data created and maintained by institutions implementing Earth observation projects through creating Document-metadata in the DIAS metadata creation support tool. Anyone can use the DIAS data discovery system by accessing <http://search.diasjp.net>, and can download data files of 270 DIAS released datasets, can access 80 datasets outside DIAS through the system. We are also collecting metadata from related data centers and which is searchable and accessible through the system.

Until now, we have had workshop concerning about metadata input 6 times as “DIAS metadata input camp”. The initial workshop participants were the data owners or providers who should create Document-metadata. The recent workshop increased librarians who are interested in research data management of open science. In order to share how to cataloging research data using Document-metadata, in the workshop, participants had experienced the difference between the metadata of the research data and the metadata of the literature. We report issues about how to manage metadata to data providers and librarian and issues about how to introduce research data to wide users in an easy-to-understand manner using metadata.

キーワード : DIAS、地球観測データ、メタデータ、オープンサイエンス

Keywords: DIAS, Earth Observation data, Metadata, Open Sciecn

Web service for reproducible multidisciplinary data visualization

*今井 弘二¹、村山 泰啓¹、海老沢 研²、池田 大輔³、瀬口 大介³

*Koji Imai¹, Yasuhiro Murayama¹, Ken Ebisawa², Daisuke Ikeda³, Daisuke Seguchi³

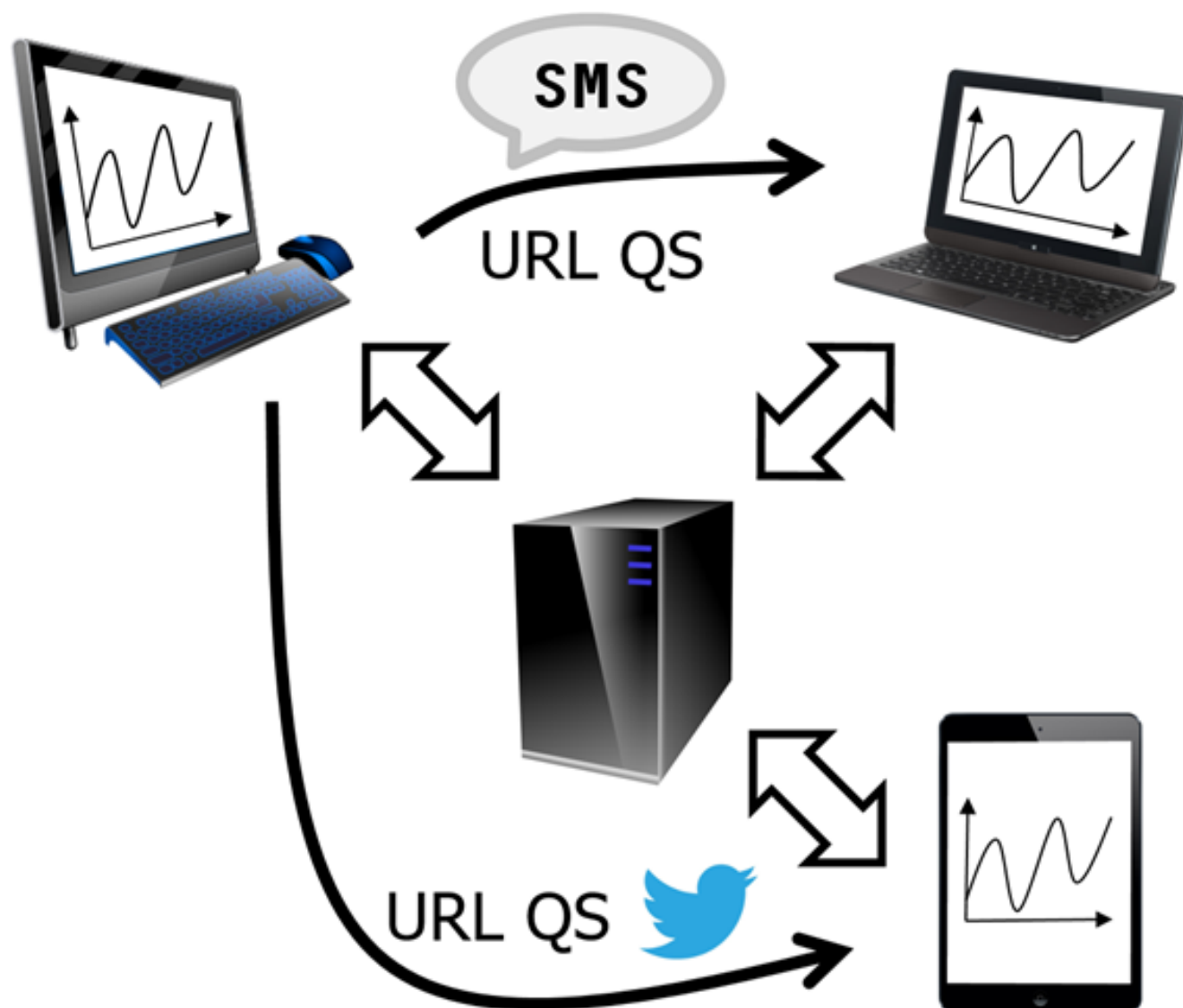
1. 情報通信研究機構、2. 宇宙航空研究開発機構 宇宙科学研究所、3. 九州大学

1. National Institute of Information and Communications Technology, 2. Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science, 3. Kyushu University

We propose a new method for reproducible data visualization on a web browser. A web service, Cross-Cutting Comparisons (C3) has a query string (QS)-controllable system to make various interactive charts of earth, planetary and space sciences. By including information of data handling procedures in the QS in an orderly manner, the chart is easy to understand, remake and share via text-based communication tools.

キーワード：オープンデータ、オープンサイエンス、引用

Keywords: open data, open science, citation



Start-up of earth observation by a small laboratory

小山 幸伸¹、*宮成 祐輔¹

Yukinobu Koyama¹, *YUSUKE MIYANARI¹

1. 大分工業高等専門学校

1. National Institute of Technology, Oita College

In Japan, there is an institution of higher education which is different from university system.

There are National Institute of Technology (NIT) in Japan in total of 51 colleges. The head quarter is located in Tokyo, but the each college is established in most in 47 prefectures in Japan. Because it's scattered about a various part of Japan, those are a strong potential earth observation base.

The NIT, Oita College is located in Oita Prefecture, Kyushu, Japan.

Because the vocational researcher is little again, too, because they're higher educational facilities, but he makes the young generation the subject, there is a problem with the continuity of the study.

However, it's potential because I split regionally.

キーワード：流星、電波観測、多点観測、データ共有、メタデータ、識別子

Keywords: Meteor, Radio observation, Multi-point observation, Data sharing, Metadata, Identifier

Terminological Ontologies and Vocabulary Broker for Open Science

*Bernd Ritschel¹, Günther Neher², Toshihiko Iyemori³, Yasuhiro Murayama⁴

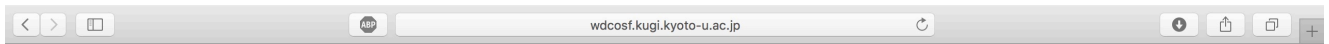
1. None, 2. University of Applied Sciences Potsdam, 3. Data Analysis Center for Geomagnetism and Space Magnetism, Graduate School of Science, Kyoto University, 4. National Institute of Information and Communications Technology, Japan

Keyword vocabularies as part of metadata standards, such as NASA GCMD DIF, SPASE data model, ESPAS keyword ontology or UAT thesaurus are used to tag and qualify specific metadata elements in a standardised way. The different concepts behind the used keywords transport specific semantic knowledge about features of the tagged elements. The scope and the validity of the concepts and keywords normally is limited to a specific domain, such as earth and space physics or astronomy. Natural language is used to express the semantic of the concepts and appropriate keywords. Therefore diverse keywords are used in different metadata standards to express same or very similar concepts. Even in the same domain different keywords are used to describe the same concept. Out of that there is the problem using keywords for the search of data within different repositories. In order to overcome this challenge, we have developed a semantic Web based Vocabulary Broker framework which is connecting appropriate keywords mainly using "skos:closeMatch" relationships for the expression of concordances.

Terminological ontologies derived from the above mentioned metadata standards are processed, and semantic based keyword matches are generated. The original ontology and the mapped parts are managed by the Open Semantic Framework (OSF). The Vocabulary Broker application provides both, schema based browsing and keyword search features. The main idea of the Vocabulary Broker, the semantic (Web) based mashup of keywords, prepares the way for a seamless and overlapping data search within different data repositories, which are managed by different metadata standards. This idea works within a domain or even cross-domain. Therefore our approach is a valuable contribution to mashup data and knowledge within an Open Science environment.

Vocabulary Broker URL: <http://wdcosf.kugi.kyoto-u.ac.jp>

Keywords: Metadata Standard, Keyword Vocabulary, Terminological Ontology, Matching Ontologies, Vocabulary Broker, Open Science



World Data System Vocabulary Broker - Proof of Concept - A +
Linking Research Data

Home | [GCMD Keywords](#) | [SPASE Keywords](#) | [ESPAS Keywords](#) | [UAT Keywords](#)

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Update of Search Results page

Submitted by wdcosf on Fri, 08/26/2016 - 19:55

To improve user experience we modified the presentation of search results when performing a "Concept Search". Instead of just displaying the Concept keyword, we now show additional context information like the keyword scheme to which the term belongs (GCMD, SPASE, ESPAS or UAT respectively), a short definition of the term if available from the vocabulary maintainers, and direct links to <skos:relatedMatch> or <skos:closeMatch> keywords from other vocabularies, if they exist.

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Integration of UAT vocabulary

Submitted by wdcosf on Thu, 08/11/2016 - 22:20

The domain-oriented [Unified Astronomy Thesaurus](#) vocabulary is based on concepts which are also used in neighboring domains, such as geophysics, especially magnetic field research, near earth-space exploration and solar-terrestrial physics. The space weather and space climate domains are covered by UAT concepts too. Therefore we think, the integration of the UAT vocabulary into the Vocabulary Broker is a benefit for astronomers but also geo and space scientists.

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IUGONET Type-A: web service for solar-terrestrial science

*梅村 宜生¹、阿部 修司²、新堀 淳樹¹、田中 良昌³、能勢 正仁⁴、上野 悟⁵

*Norio Umemura¹, Shuji Abe², Atsuki Shinbori¹, Yoshimasa Tanaka³, Masahito Nose⁴, Satoru UeNo⁵

1. 名古屋大学宇宙地球環境研究所、2. 九州大学国際宇宙天気科学・教育センター、3. 情報・システム研究機構 国立極地研究所、4. 京都大学理学研究科附属地磁気世界資料解析センター、5. 京都大学理学研究科附属天文台

1. Institute for Space-Earth Environmental Research, Nagoya University, 2. International Center for Space Weather Science and Education, Kyushu University, 3. National Institute of Polar Research, 4. Data Analysis Center for Geomagnetism and Space Magnetism, Graduate School of Science, Kyoto University, 5. Kwasan and Hida Observatories, Graduate School of Science, Kyoto University

IUGONET is a community to promote solar-terrestrial physics studies, which NIPR, Nagoya Univ., Kyoto Univ., Tohoku Univ., Kyusyu Univ., NICT, NAOJ, JMA and Kanazawa Univ participate in. Our team has mainly developed two products, i.e., UDAS and IUGONET Type-A. UDAS is an analysis software based on SPEDAS (Space Physics Environment Data Analysis Software) and IDL (Interactive Data Language), and IUGONET Type-A is a web service to provide data information and web-based analysis platform 'UDAS web'.

IUGONET Type-A was opened to public on 1 Nov, 2016. This service has functions to show metadata of observational data (e.g., description, acknowledgement [data policy], start and stop date, contact person, data publisher URL, observatory and instrument information), quick-look images (QLs), and how to create these QLs. In particular, thumbnail display of QL plots of retrieved data is very useful to view various data and find correlated data. In addition, UDAS web enables to plot data easily on web browser (PC, smartphone, tablet device and more) without any installation/setup of dedicated software and license. Therefore, IUGONET Type-A is an one-stop web service that enables to search, understand, visualize and test data, and promotes new interdisciplinary studies regarding the solar-terrestrial physics even for researchers in emerging countries.

Furthermore, IUGONET Type-A was built by 'IUGONET Web Application Framework for Science'. This framework can also handle various metadata formats and work on other system. For example, this framework is now being used for Fukushima radiation database, RADARC, and in future we will divert it to some database for various data, such as meteorological data, sequential (ensemble-based) data, and the other scientific data. We believe that this framework is useful to share scientific knowledge between wider communities and can contribute to open science.

キーワード：太陽地球系科学、オープンサイエンス、オープンデータ、データベースシステム

Keywords: solar-terrestrial environmental science, open science, open data, database system

太陽地球系物理学分野における融合研究推進への取り組み Activity for promoting interdisciplinary studies of solar-terrestrial physics

*田中 良昌¹、梅村 宜生²、阿部 修司³、新堀 淳樹²、能勢 正仁⁴、上野 悟⁵

*Yoshimasa Tanaka¹, Norio Umemura², Shuji Abe³, Atsuki Shinbori², Masahito Nose⁴, Satoru UeNo⁵

1. 国立極地研究所、2. 名古屋大学宇宙地球環境研究所、3. 九州大学国際宇宙天気科学・教育センター、4. 京都大学大学院理学研究科、5. 京都大学大学院理学研究科附属天文台

1. National Institute of Polar Research, 2. Institute for Space-Earth Environmental Research, Nagoya University, 3. International Center for Space Weather Science and Education, Kyushu University, 4. Graduate School of Science, Kyoto University, 5. Kwasan & Hida Observatories, School of Science, Kyoto University

Inter-university Upper atmosphere Global Observation NETwork (IUGONET) is a Japanese inter-university project whose goal is to effectively utilize upper atmospheric data, including solar and planetary data, which have been separately archived by Japanese universities and institutes for more than 60 years. This project was established in FY2009 originally by Tohoku University, Nagoya University, Kyoto University, Kyushu University, and National Institute of Polar Research, that have been conducting global ground-based network observations of the upper atmosphere, and several other universities and institutes joined in the project later. We present our activities for sharing the data, facilitating interdisciplinary studies of solar-terrestrial physics, and promoting open science.

We have mainly developed two tools, i.e., an analysis software and a metadata database for the upper atmospheric data. The analysis software is based on Space Physics Environment Data Analysis Software (SPEDAS) that is a grass-roots software written by Interactive Data Language (IDL) for space physics community and supports multiple missions. We have provided a plug-in software for SPEDAS, which allows users to load, visualize, and analyze the IUGONET data with SPEDAS. The metadata database enables users to cross-search various kinds of the upper atmosphere data distributed across the IUGONET members. We have registered the metadata of more than 1,000 dataset made in the Space Physics Archive Search and Extract (SPASE) format to our metadata database. Recently, we newly released IUGONET Type-A, which is a one-stop web service based on the metadata database. The IUGONET Type-A provides services to search data, show information of data (i.e., metadata), display quick-look (QL) plot of data, and plot data interactively with SPEDAS. It is useful for users to find interesting solar-terrestrial phenomena and proceed to more detailed analysis of them by using SPEDAS. In order to explain how to use these IUGONET data and tools, we hold tutorial seminars several times a year in Japan and sometimes foreign countries. In addition, we introduce our various activities for data sharing and open science.

キーワード：超高層大気、メタデータデータベース、データ解析ソフトウェア、太陽地球系物理学、IUGONETプロジェクト

Keywords: upper atmosphere, metadata database, data analysis software, solar terrestrial physics, IUGONET project

Juno-Ground-Radio Observation Support Tools

*Baptiste Cecconi^{1,2,3,4}, Philippe Zarka^{1,2}, Renaud Savalle³, Pierre Lesidaner³, Corentin Louis^{1,2}, Laurent Lamy^{1,2}, Andree Coffre², Laurent Denis², Cedric Viou², Alexander A Konovalenko⁵, Vyacheslav Zakharenko⁵, Serge Yerin⁵, Anastasia Skoryk⁵, Yasumasa Kasaba⁶, Hiroaki Misawa⁶, Fuminori Tsuchiya⁶, Yasuhide Hobara⁷, Tomoyuki Nakajo⁸, Kasumasa Imai⁹, Vladimir Riabov¹⁰, Hanna Rothkaehl¹¹, Glenn S Orton¹², Tom Momary¹², Jean-Mathias Griessmeier¹³, Masafumi Imai¹⁴, Julien N Girard¹⁵, Marin Anderson¹⁶, Nicolas Andre^{17,4}, Vincent Genot^{17,4}, Rob Ebert¹⁸, Tobia Carozzi¹⁹, Tomoki Kimura²⁰, William S Kurth¹⁴, Chuck A Higgins^{21,22}, John L Mugler²¹, Dave Typinski²², Tracy Clarke²³, Jim Sky^{24,22}, Richard Flagg²², Francisco Reyes²², Wes Greenman²², Jim Brown²², Andy Mount²², Tom Ashcraft²², Jim Thieman^{25,22}, Whit Reeve²², Shing Fung^{25,22}, Todd King²⁶, Mark Sharlow²⁶, Scott Bolton¹⁸

1. LESIA, Observatoire de Paris, CNRS, PSL Research University, Meudon, France, 2. Station de Radioastronomie de Nancay, Observatoire de Paris/PSL Research University/CNRS/Université d'Orléans, Nancay, France, 3. PADC, Observatoire de Paris/PSL Research University/CNRS, Paris, France, 4. CDP, CNES/CNRS/Université Paul Sabatier/Observatoire de Paris, Toulouse, France, 5. Institute of Radio Astronomy, Ukrainian Academy of Sciences, Kharkov, Ukraine, 6. Tohoku University, Sendai, Japan, 7. University of Electro-Communications, Tokyo, Japan, 8. Fukui University of Technology, Fukui, Japan, 9. Kochi National College of Technology, Nankoku, Japan, 10. Future University, Hakodate, Japan, 11. Space Research Center, Polish Academy of Sciences, Warsaw, Poland, 12. Jet Propulsion Laboratory, NASA, Pasadena, CA, USA, 13. LPC2E, CNRS/Université d'Orléans, Orléans, France, 14. Department of Physics and Astronomy, University of Iowa, Iowa-City, IA, USA, 15. AIM/IRFU/SAP-CEA, Université Paris Diderot, Saclay, France, 16. California Institute of Technology, Pasadena, CA, USA, 17. IRAP, CNRS, Université Paul Sabatier, Toulouse, France, 18. Space Science Department, Southwest Research Institute, TX, USA, 19. Institute of Space and Geophysics, Chalmers, Onsala, Sweden, 20. RIKEN, Tokyo, Japan, 21. Middle Tennessee State University, Murfreesboro, TN, USA, 22. RadioJOVE, 23. Naval Research Laboratory, Washington DC, USA, 24. Radio-Sky Publishing, USA, 25. NASA-Goddard Space Flight Center, Greenbelt, MD, USA, 26. IGPP, UCLA, Los Angeles, CA, USA

In the frame of the NASA/Juno mission, an international support activity with observations in the low frequency radio range has been set up. We are proposing a new set of tools directed to data providers as well as users, in order to ease data sharing and discovery. The data service we will be using is EPN-TAP, a planetary science data access protocol developed by Europlanet-VESPA (Virtual European Solar and Planetary Access). This protocol is derived from IVOA (International Virtual Observatory Alliance) standards. Data from all major decametric radio instruments will contribute: Nançay Decameter Array (France), LOFAR (France, Sweden, Poland), URAN (Ukraine), LWA (USA), Iitate Radio Observatory (Japan), etc. Amateur radio data from the RadioJOVE project is also available. We will first introduce the VO tools and concepts of interest for the planetary radioastronomy community. We will then present the various data formats now used for such data services, as well as their associated metadata. We will finally show various tools that make use of this shared datasets. This activity also supports the development of the ESA/JUICE (Jupiter Icy Moon Explorer) mission, and that of the planetary sciences virtual observatory.

Keywords: Jupiter, Decametric Radio Emissions, Juno, Virtual Observatory

世界科学データシステム・アジアオセアニア会議 2017 WDS Asia-Oceania Conference 2017

*渡邊 堯¹、家森 俊彦²、村山 泰啓¹

*Takashi Watanabe¹, Toshihiko Iyemori², Yasuhiro Murayama¹

1. 国立研究開発法人情報通信研究機構、2. 京都大学大学院理学研究科付属地磁気世界資料解析センター

1. National Institute of Information and Communications Technology, 2. Data Analysis Center for Geomagnetism and Space Magnetism, Kyoto University

ICSUでは、冷戦下の1957-58年に実施された国際地球観測年（IGY）以来、Full and Open Accessの理念のもとに、研究データの長期保全と公開態勢の構築を進めており、自然科学系から社会科学系分野を含む研究データを扱うデータセンター等の国際組織であるWorld Data System (WDS) を2008年に設置している。WDSはデータセンター等のメンバーによって構成されており、現在約90メンバーを数えるが（日本は3機関が加入済）、メンバーの主体は欧米に偏在しており、アジア・太平洋地区の、特に東南アジアは完全な空白地帯となっている。しかし近年この地域は、環境問題や経済活動における重要性が著しく増しているのにも関わらず、データの保全や公開態勢の構築が遅れている。そこで、日本、中国、インド、オーストラリアにおけるWDSメンバーとWDSの活動計画に賛同するデータセンター等との連携により、WDSを軸としたアジア・太平洋地区におけるデータ関連機関のネットワークを構築することを目的とした表記の会議を、2017年9月26-27日に京都市京都大学で開催することとなった。ICSUや日本学術会議が進めている地球規模の持続可能性を実現するための研究活動であるFuture Earth*では、特に東南アジア地区におけるデータの保全・公開態勢の構築が重要課題となっており、本研究会を開催する国際的意義は大きい。

キーワード：科学データ、国際科学会議、世界科学データシステム、アジア・オセアニア

Keywords: Science Data, ICSU, WDS, Asia-Oceania

みんなで翻刻：市民参加の地震史料解読プロジェクト

Minna de Honkoku: online transcription project of earthquake-related historical documents

*加納 靖之¹、橋本 雄太²、中西 一郎³、大邑 潤三⁴、天野 たま²、久葉 智代⁴、酒井 春乃⁵、伊藤 和行²、小田木 洋子³、西川 真樹子⁶、堀川 晴央⁷、水島 和哉⁸、安国 良一⁹、山本 宗尚¹⁰

*Yasuyuki Kano¹, Yuta Hashimoto², Ichiro Nakanishi³, Junzo Ohmura⁴, Tama Amano², Tomoyo Kuba⁴, Haruno Sakai⁵, Kazuyuki Ito², Yoko Odagi³, Makiko Nishikawa⁶, Haruo Horikawa⁷, Kazuya Mizushima⁸, Ryoichi Yasukuni⁹, Munehisa Yamamoto¹⁰

1. 京都大学防災研究所、2. 京都大学大学院文学研究科、3. 京都大学大学院理学研究科、4. 佛教大学大学院文学研究科、5. 京都大学文学部、6. 国際日本文化研究センター、7. 産業技術総合研究所、8. 京都大学大学院経済学研究科、9. 住友史料館、10. 賀茂県主同族会

1. Disaster Prevention Research Institute, Kyoto University, 2. Graduate School of Letters, Kyoto University, 3. Graduate School of Science, Kyoto University, 4. Graduate School of Literature, Bukkyo University, 5. Faculty of Letters, Kyoto University, 6. International Research Center for Japanese Studies, 7. National Institute of Advanced Industrial Science and Technology, 8. Graduate School of Economics, Kyoto University, 9. Sumitomo Historical Archives, 10. Foundation of the Kamoagatanushi Clan

京都大学古地震研究会では、2017年1月に「みんなで翻刻【地震史料】」を公開した (<https://honkoku.org/>)。 「みんなで翻刻」は、Web上で歴史史料を翻刻するためのアプリケーションであり、これを利用した翻刻プロジェクトである。ここで、「みんなで」は、Webでつながる人々（研究者だけでなく一般の方をふくむ）をさしており、「翻刻」は、くずし字等で書かれている史料（古文書等）を、一字ずつ活字（テキスト）に起こしていく作業のことである。

古地震（歴史地震）の研究においては、伝来している史料を翻刻し、地震学的な情報（地震発生の日時や場所、規模など）を抽出するための基礎データとする。これまでに地震や地震に関わる諸現象についての記録が多数収集され、その翻刻をまとめた地震史料集（たとえば、『大日本地震史料』、『新収日本地震史料』など）が刊行され、活用されてきた。いっぽうで、過去の人々が残した膨大な文字記録のうち、活字（テキスト）になってデータとして活用しやすい状態になっている史料は、割合としてはそれほど大きくはない。未翻刻の史料に重要な情報が含まれている可能性もあるが、研究者だけですべてを翻刻するのは現実的ではない。

このような状況のなか、「みんなで翻刻【地震史料】」では、翻刻の対象とする史料を、地震に関する史料とし、東京大学地震研究所図書室が所蔵する石本コレクションから、114冊を選んだ。このコレクションを利用したのは、既に画像が公開されており権利関係がはっきりしていること、部分的には翻刻され公刊されているが、全部ではないこと、システム開発にあたって手頃なボリュームであること、過去の地震や災害に関係する史料なので興味をもってもらえる可能性があること、が主な理由である。

「みんなで翻刻【地震史料】」で翻刻できる史料のうち一部は、既刊の地震史料集にも翻刻が収録されている。しかし、ページ数の都合などにより省略されている部分も多い。「みんなで翻刻【地震史料】」によって、114冊の史料の全文の翻刻がそろそろことにより、これまで見過ごされてきた情報を抽出できるようになる可能性がある。石本文庫には、内容の類似した史料が含まれていることが知られているが、全文の翻刻により、史料間の異同の検討などにより、これまでより正確に記載内容を理解できるようになるだろう。

「みんなで翻刻」では、ブラウザ上で動作する縦書きエディタを開発・採用して、オンラインでの翻刻をスムーズにおこなう環境を構築したほか、翻刻した文字数がランキング形式で表示されるなど、楽しみながら翻刻できるような工夫をしている。また、利用者どうしが、編集履歴や掲示板機能によって、翻刻内容について

議論することができる。さらに、くずし字学習支援アプリKuLAと連携している。

正式公開後3週間の時点で、全史料114点中29点の翻刻がひとりひとり完了している。画像単位では3193枚中867枚（全体の27.2%）の翻刻がひとりひとり完了している。総入力文字数は約70万字である。

未翻刻の文書を翻刻することがプロジェクトの主たる目的である。これに加えて、Web上で活動することにより、ふだん古文書や地域の歴史、災害史などに興味をもっていない層の方々が、古地震や古災害、地域の歴史に関する情報を届けるきっかけになると考えている。

謝辞：「みんなで翻刻【地震史料】」では、東京大学地震研究所所蔵の石本文庫の画像データを利用した。

キーワード：歴史地震、人文情報学、Webアプリ、クラウドソーシング

Keywords: Historical earthquake, Digital Humanities, Web application, Crowdsourcing



社会との協働が切り拓くオープンサイエンスの未来：日本におけるマルチステークホルダー・ワークショップの報告

Future of Open Science foreseen with society: report on a multi-stakeholder workshop in Japan

*近藤 康久^{1,2}、林 和弘²、池内 有為^{3,2}、栗林 美紀²、矢野 幸子²、北本 朝展⁴

*Yasuhisa Kondo^{1,2}, Kazuhiro Hayashi², Ui Ikeuchi^{3,2}, Miki Kuribayashi², Sachiko Yano², Asanobu Kitamoto⁴

1. 総合地球環境学研究所、2. 文部科学省科学技術・学術政策研究所、3. 筑波大学大学院図書館情報メディア研究科、4. 国立情報学研究所

1. Research Institute for Humanity and Nature, 2. National Institute of Science and Technology Policy, 3. Graduate School of Library, Information and Media Studies, Tsukuba University, 4. National Institute of Informatics

地球環境問題や少子高齢化などの社会課題の解決をめざす研究には、異分野の研究者や政府・自治体、企業、NPO、地域住民など社会の多様なステークホルダーが知識経験を持ち寄り、立場を超えた対話と熟議を通して研究計画の共同立案 (co-design)、知識の共同生産 (co-production)、成果の共同展開

(co-dissemination) を行い、課題解決に向けた意思決定をリードする (co-leadership) という超学際アプローチ (transdisciplinary approach) が重要である。近年、ITやソーシャルデザインなどの技術知を持つプロボノ (専門技能ボランティア) がオープンデータを活用して、社会課題の解決に積極的に関与するようになった。今後、研究者とプロボノが、社会の多様なステークホルダーと協働することにより、研究データのオープン化と市民科学 (シチズンサイエンス) が結びつき、課題解決が促進されるとともに、社会との協働をより強く意識したオープンサイエンスの実現が期待される。しかし、その具体的方法や問題点についてはまだ事例の蓄積が少ない。そこで、2017年1月に京都で、人文・社会科学と自然科学系の研究者、政府関係者、地方行政職員、企業職員、プロボノ (高度技能ボランティア)、図書館員など37名の参加者によるマルチステークホルダー・ワークショップを開催し、グループ対話のテーマを当日決めるアンカンファレンス方式により、社会との協働を念頭に置いた際のオープンサイエンス政策の課題を多角的に検討した。その結果、オープンサイエンスの取り組みは、各研究分野の慣習として積み上げていく必要があること、市民科学にはデータ基盤の共同構築と社会転換のためのアクションという2つの役割があること、研究者コミュニティと社会の知識体系を双方向的に連環する橋渡し人材を魅力的な職業として確立する必要があることなどが気づきとして得られた。本発表では、これらの論点を整理した上で、社会のニーズに照らしたオープンサイエンスの推進に必要な方策を提示する。

キーワード：社会協働による課題設定、未来予測、マルチステークホルダー・ワークショップ、科学技術政策、日本

Keywords: Co-design with society, Foresight, Multi-stakeholder workshop, Science and technology policy, Japan

Research Data Management towards Open Science: An attempt at NIES

*白井 知子¹、尾鷲 瑞穂¹、真板 英一¹、三枝 信子¹

*Tomoko Shirai¹, Mizuho Owashi¹, Eiichi Maita¹, Nobuko Saigusa¹

1. 国立環境研究所地球環境研究センター

1. National Institute for Environmental Studies

The open science movement is picking up steam worldwide recently. Opening access to journal articles has been a hot topic in open science for about a couple of decades, but opening access to research data (open data) is another critical component of open science. Open data enables a wider group of researchers to build upon existing knowledge by reusing data in novel ways, resulting in increased citations and opportunities for collaboration. However, except some disciplines that already have a culture of sharing research data at least within the communities, appropriate policies and standards for research data management are not consolidated.

National Institute for Environmental Studies (NIES) has recently started to take action on this issue. It started by request from some researchers about minting Digital Object Identifier (DOI) to the research data, which ended up becoming a member of the Japan Link Center, one of the DOI registration Agencies and started minting DOI to research data since 2016. As the beginning was “bottom-up” rather than “top-down”, it has been “reactive approach” rather than “proactive approach”. A working group for promoting open science has been officially formed in 2017, in order to discuss about the institutional repository, data management policies of the institute.

It is not easy to promote open science as an institute though. There are various disciplines in environmental research and in some disciplines, majority of researchers are still reluctant to make their research data publicly available. Resources (both money and human) available for data management is very limited as well. We will present the situation of our attempts to promote open science and discuss about existing issues as a case study of a research institute.

キーワード：オープンサイエンス、オープンデータ、研究データマネジメント

Keywords: Open Science, Open data, Research data management

On recognition of "primary data" producers through DOI minted to "secondary" data (derived from primary data)

*村山 泰啓¹、能勢 正仁²、小山 幸伸³、武田 英明⁵、是津 耕司¹、家森 俊彦²、渡邊 堯^{4,1}、國武 学¹、今井 弘二¹

*Yasuhiro Murayama¹, Masahito Nose², Yukinobu Koyama³, Hideki Takeda⁵, Koji Zettsu¹, Toshihiko Iyemori², Takashi Watanabe^{4,1}, Manabu Kunitake¹, Koji Imai¹

1. 国立研究開発法人情報通信研究機構統合ビッグデータ研究センター、2. 京都大学理学研究科附属世界地磁気資料解析センター、3. 大分工業高等専門学校、4. ICSU-WDS国際プログラムオフィス、5. 国立情報学研究所

1. Big Data Integration Research Center, National Institute of Information and Communications Technology, 2. WDC for geomagnetism Kyoto, Kyoto University, 3. Oita National College of Technology, 4. ICSU-WDS International Programme Office, 5. National Institute of Informatics

In specific scientific disciplines (e.g., Earth and Planetary Sciences), some studies are conducted based on data directly retrieved from experiments, observations, and/or simulation, etc. (hereinafter "primary" data or PD), while there are other studies based on data generated from compilation and/or further data processing of PD (hereinafter "secondary" data or SD). SD is sometimes generated from processing multiple PD products (e.g., at different geographical locations, at different time, at different observational techniques/conditions and so on). In a research field where SD is more popularly used, the current data-DOI mechanism may not be sufficient in supporting data producers to keep sustainability of their data creation/curation/management works of PDs, because it is often difficult to ensure they receive proper recognition (and with it, enhanced reputation) even when SD generated from their PD products are used frequently and correctly cited in a number of research papers. In this paper, we attempt to focus on this difficulty for PD producers and we propose a revision in a metadata schema that enables the PD producers' work is appropriately recognized.

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