IAEA International Atomic Energy Agency

Newsletter Title

A newsletter of the Nuclear Data Section (NDS)
No. 54, November 2012

ISSN 0257-6376

http://www-nds.iaea.org/

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Merit award presented to Naohiko Otsuka by Daud Mohamad, DDG-NA

From the Section Head

The Nuclear Data Section, like much of society, is very dependent on computers and computer networks to carry out its work. While in previous newsletters we have highlighted the NDS web site which is so important in data distribution, the actual network and servers that lie behind it will be much less well known to readers. On page 3 you will find a summary of the section's IT resources, showing both the new hardware and recent changes in configuration. Another reason to focus on this area is because of the fact that we had to shut down our website during February and March this year for several days because of potential security risks. There has been considerable hardening of our system in response to the threats and I know that this has caused inconvenience to many users. I apologise for this but such caution is necessary and I hope that we have by now regained most of the functionality that we temporarily lost.

One pleasure I have in my job is to recommend section staff for awards to reflect the excellent work they all do. This year Naohiko Otsuka received a Merit Award and the photograph above shows him being presented with this by Daud Mohamad, the DDG of the Department of Nuclear Sciences and Applications. Congratulations to Naohiko for his efforts, particularly in our EXFOR compilation work.

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All services provided to users are free of charge. Please contact us at the following addresses:

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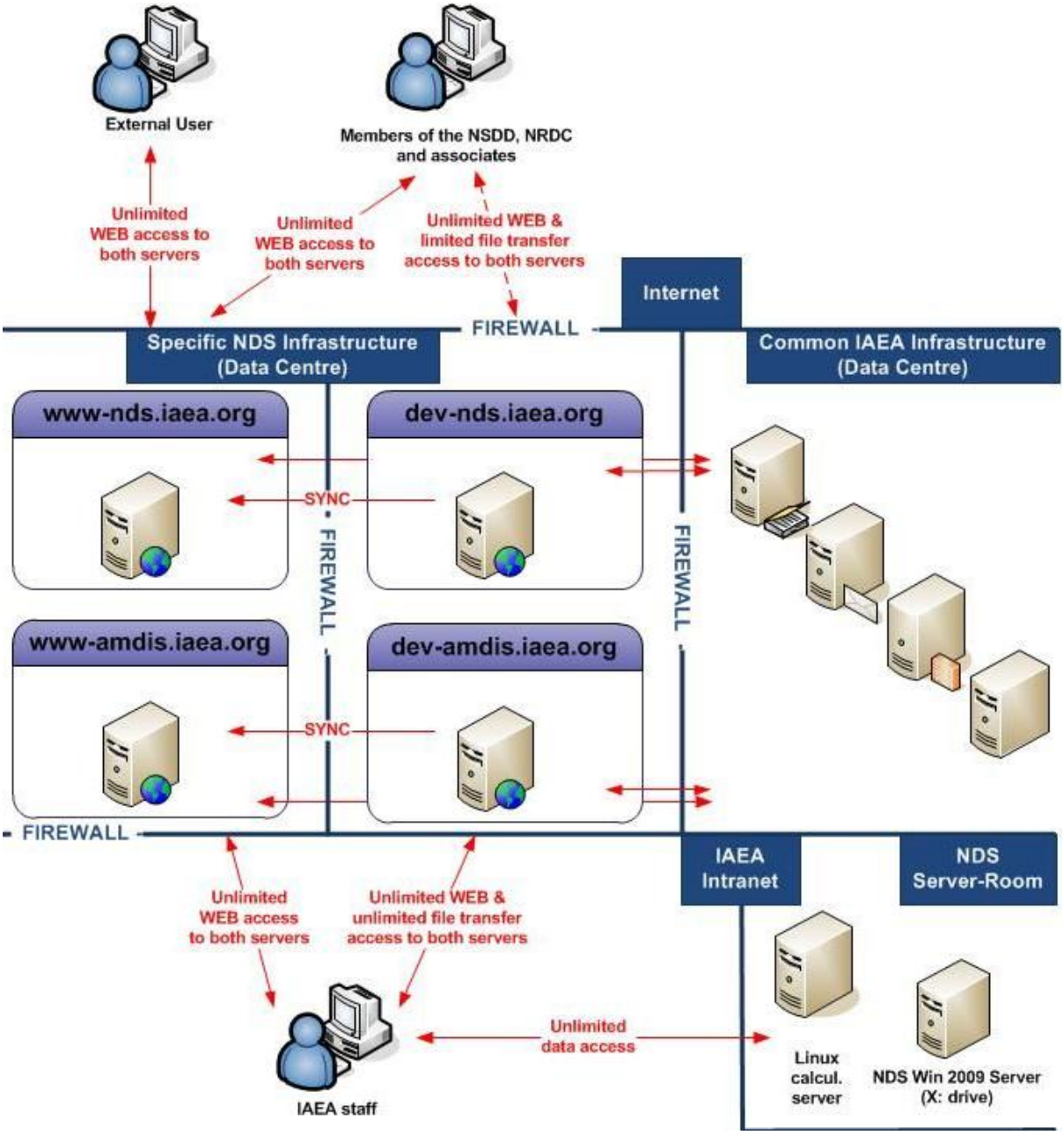
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Nuclear Data Section IT Resources

To provide access to the various atomic and nuclear databases for both internal and external users, the Nuclear Data Section has maintained its own computer network and servers for many years. The technology has evolved over time, but currently we operate servers running a Linux operating system. We have experienced an accelerated growth of storage requirements with significant increases in network traffic on the common production webserver of Nuclear Data Services (NDS) and the Atomic and Molecular Data Unit (AMDU). Based on our experience and the recent need to implement stricter IAEA security rules we have identified the following tasks to be carried out:

- Separate the NDS and AMDU web services to different physical hardware.
- Provide more data storage for new projects and existing applications.
- Redesign the hardware and network infrastructure according to IAEA security requirements.
- Implement new IAEA security guidance and rules.

To achieve these goals, we have started the process of acquisition, commissioning and assembly into racks of two modern HP ProLiant DL380 Generation 7 servers in the IAEA Data Centre and relocation of some the existing NDS hardware from the Data Centre to the NDS server room. This has the aim of splitting the NDS production and data development services onto these two new powerful 24 CPU servers. Additionally, the built in 5.4 TB high-availability storage system helps to solve the hard disc capacity bottlenecks. The current two HP ProLiant DL380 Generation 5 servers with 8 CPUs will become the AMDU's main and development web servers.



In general the new architecture is split into two major areas, separated by a firewall, called the production and data development zones (see figure page 2). The production zone contains the main NDS web server *www-nds.iaea.org* and the Atomic and Molecular Data Unit's web server *www-amdis.iaea.org*. The data development zone contains the hardware mirrored NDS and AMDU development servers *dev-nds.iaea.org* and *dev-amdis.iaea.org*. This new architecture allows us to:

- Separate cleanly the NDS and AMDU web services.
- Increase our storage capacity to an adequate level for both web services.
- Separate the production and data development environments for both web services.
- Harden the whole environment from a security point of view.
- Increase the disaster recovery capability using almost completely mirrored hardware.

All four servers run under the latest stable Red Hat Enterprise Linux Operational System and also use the latest stable components (i.e. relational databases such as MySQL, PostgreSQL, web servers like Apache and Tomcat etc.). The hardware and software environment has been rigorously hardened according to IAEA best practice security rules and a regular review of them has been implemented.

Computer Codes and Data Libraries – News

Databases and libraries are available for download or on CD-ROM/DVD cost-free on request
Please find a complete list of all computer codes and data libraries available from NDS on:
http://www-nds.iaea.org/cd-catalog.html

EXFOR - the database of experimental cross sections is updated regularly (on a monthly basis) and accepts newly published or missing reaction data. Recently the Maxwellian averaged cross-sections (MACS) evaluated by the Karlsruhe group were included in a special EXFOR entry V0102. It contains all MACS which were evaluated based on measured cross sections at the neutron spectrum temperature kT=30 keV.

IRDFF – the International Reactor Dosimetry and Fusion File, the starter version 1.02, was released by NDS in June 2012. It supersedes the previous version, IRDF-2002, and now contains cross-sections and related decay data for 74 dosimetry and 3 absorption (detector cover materials) reactions. An essential step forward was an energy extension from 20 up to 60 MeV to cover broader fusion and spallation applications such as IFMIF. The International Nuclear Data Committee at its recent meeting recommended the launch of a new CRP on testing and validation and production of a verified reference library for use by MS (www-nds.iaea.org/IRDFFtest/).

JENDL-4.0 – the Japanese Evaluated Neutron Data Library was updated in September 2012. New release JENDL-4.0u includes revisions of neutron cross-sections for ^{2}H, ^{10}B, ^{48}Ti, ^{52,53}Cr, ^{59}Ni, ^{109}Ag, ^{127m,129m}Te, ^{233,234,235,238}U, ^{239}Pu, ^{243}Am and fission product library for ^{241}Pu, ^{242m}Am.

NSR - the Nuclear Science References database was updated in July 2012. It includes the latest bibliography of nuclear physics articles, advanced search tools and cross references (hyperlinks) to EXFOR and CINDA.

JANIS-3.4 – is a Java-based Nuclear Data Display program designed to facilitate the visualisation and manipulation of nuclear data. The latest version 3.4 released in May 2012 by NEA supports recent changes in ENDF format, includes latest releases of the major libraries as remote databases and has other improved functionalities.

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We have been focussing in the last few months on the programme and budget for the 2014-2015 biennium. While it is obvious that there are many pressing areas of technical work that need to be addressed by section staff, as discussed in the recent INDC meeting (see page 5) which supported new CRPs and urged initiatives in several areas, there are increasing pressures on the available budget. Nuclear data users can help by taking all opportunities to remind both their organizations and senior management at the IAEA of the important role played by the NDS in providing nuclear data to Member States. The newsletter has been in its current form for about three years. I would welcome your feedback on the newsletter (nds.contact-point@iaea.org), specifically on the following points:

- Is the style appropriate (too technical/not technical enough)?
- Are the contents appropriate?
- What features would you like to see in future issues?

Robin Forrest

NDS Meeting Reports

Meeting reports, when finalised, available at http://www-nds.iaea.org/publications/

Workshop on Spectral Line Shapes in Plasmas Code Comparison
Vienna, Austria, April 2 - 5, 2012

Scientific Secretary: Hyun Chung, 20 participants from 9 countries.
(organized in cooperation with the Weizmann Institute of Science, Israel)

Line shape analysis is one of the most important tools for diagnostics of both laboratory and space plasmas and its reliable implementation requires accurate calculations. Many codes of varying degrees of complexity are used. This workshop was organized in order to carry out detailed comparison of results for a selected set of precisely specified problems, in order to pinpoint sources of disagreements, infer limits of applicability, and assess accuracy.

Technical Meeting (TM) of the International Network of Nuclear Reaction Data Centres
Issy-les-Moulineaux, France, April 16 - 19, 2012

Scientific Secretary: Naohiko Otsuka, 20 participants and IAEA staff



Participants of the TM of the International Network of Nuclear Reaction Data Centres

Thirteen cooperating data centres from China, Hungary, India, Japan, the Republic of Korea, Russian Federation, Ukraine, USA, NEA and IAEA were represented at this meeting, as well as the Centre heads. The main topics were: EXFOR transmission statistics, EXFOR coverage and quality control, the actual needs from the EXFOR users, latest updates of manuals, NRDC Network Documents, Protocols, EXFOR and CINDA dictionaries, EXFOR exchange and output formats as well as improvement of the web tools and software. A total of 43 working papers were presented and the results of the discussions were summarized as 20 conclusions and 74 actions.

Improved EXFOR formats for neutron cross section uncertainty and covariance were discussed and accepted. Experimentalists should be encouraged to report and submit experimental data with detailed error analysis documentation for inclusion in EXFOR using the new formats.

The EXFOR library was originally intended to collect only the neutron induced reaction data with the result that the charged particle reaction database is still incomplete. To eliminate this deficiency other resources (such as the compilation published in 'Landolt-Börnstein') were examined. It was found that 20~30% of p, d, t, ^{3}He and α induced activation experiments are still missing in EXFOR. The meeting recommended initiating an intensive compilation to fill this gap.

The summary report of this meeting is available as INDC(NDS)-0618.

18th Meeting of the IFRC Subcommittee on Atomic and Molecular Data for Fusion Vienna, Austria, April 16 - 19, 2012

Scientific Secretary: Bas Braams, 10 participants and IAEA staff

The IFRC Subcommittee on A+M Data for Fusion meets every two years to advise the IFRC and the IAEA about priorities for work in the Nuclear Data Section (by the A+M Data Unit) on atomic, molecular and plasma-material interaction data and databases for fusion energy development. Key topics for the subcommittee are the plans for future CRPs and larger technical meetings, the development of database standards and of the principal databases maintained by the unit, publication policies, and other activities of the unit. A broad topic of concern is the balance of activities between, on the one hand atomic and molecular data, and on the other hand plasma-material interaction data. Over the years there has been a steady shift of emphasis towards issues of plasma-material interaction and this is consistent with the advice given by the subcommittee at the meeting in April. The unit has most recently started a CRP on 'Data for Erosion and Tritium Retention in Beryllium Plasma-facing Materials' and the subcommittee recommends following up this CRP with one on plasma-wall interaction with irradiated tungsten and tungsten alloys and on data for plasma interaction with low activation steel surfaces. The focus on beryllium, tungsten and steel will support operation of ITER and the design of future demonstration reactor (DEMO) devices. The subcommittee reviewed all aspects of the work of the A+M Data Unit and provided many other recommendations.

29th Meeting of the International Nuclear Data Committee (INDC) Vienna, Austria, May 8 - 11, 2012

Scientific Secretary: Robin Forrest, 14 members (1 member apologised for absence), 1 advisor, 2 observers and IAEA staff



Participants of the 29th Meeting of the INDC

The INDC advises the IAEA on its programmatic activities in the field of nuclear data applications. Members, who serve in their personal capacity, are selected from IAEA Member States which maintain major nuclear data programmes, and they provide particular technical expertise, or offer a needed regional perspective. Committee members may be accompanied by advisors; observers from the OECD NEA (Nuclear Energy Agency of the Organisation for Economic Cooperation and Development) and the EC-JRC-IRMM (European Commission – Joint Research Centre – Institute for Reference Materials and Measurements) also attended the meeting.

The current membership of the INDC is: Ulrich Fischer (Germany), Boris Fursov (Russian Federation) Michal Herman (USA), Robert Jacqmin (Chairman) (France), Natalia Janeva (Bulgaria), Swaminathan Kailas (India), Young Ouk Lee (Republic of Korea), Francisco Leszczynski (Argentina), Keiichi Shibata (Japan), Deon Steyn (South Africa), Jean-Christophe Sublet (UK),

Ferenc Tarkanyi (Hungary), Nguyen Van Do (Vietnam), and Zhixiang Zhao (China). Robin Forrest (Section Head, NDS) serves as Scientific Secretary of the INDC. Note that because of his absence from the INDC meetings, Bruce Wilkin (Canada) has tendered his resignation.

During the meeting this external review body assessed the activities of the IAEA Nuclear Data Section (NDS) covering 2010 and 2011, including nuclear data and database development, and nuclear data services to all users in Member States, and made recommendations on new specific activities of the IAEA to begin in the 2014-2015 time period, in order to address the needs of Member States in the field of nuclear data. The work programme during 2012 and 2013 was described. Actions for consideration included CRPs, data development projects (DDPs), general services such as data dissemination, and specific training initiatives that fall within the responsibility of the NDS.

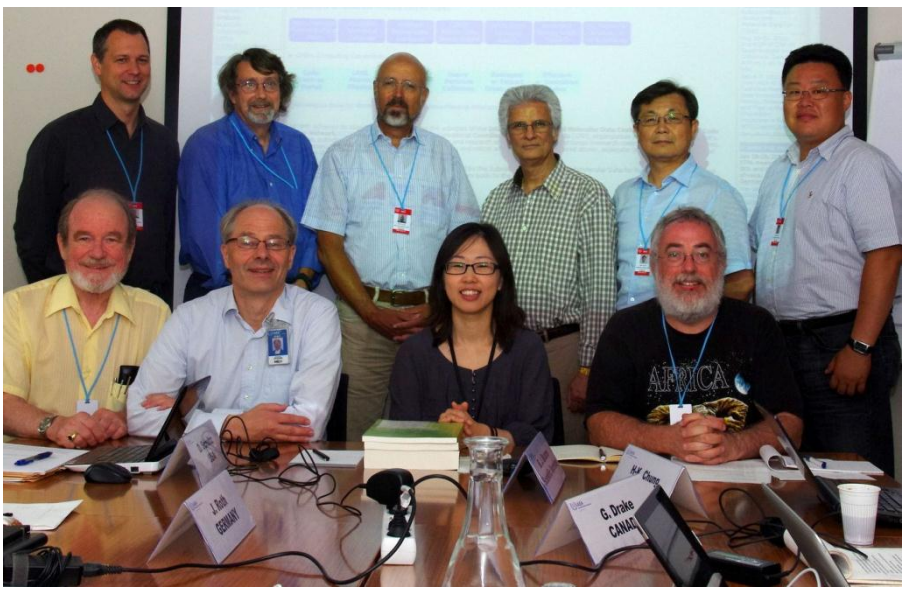


Head table of the 29th Meeting of the INDC

The Committee endorsed the NDS plans for new CRPs on beta-delayed neutron emission evaluation, material damage and input model parameters (RIPL). The importance of training was again recognised and the section was urged to continue with courses and workshops at ICTP which are considered to be especially relevant for developing countries. The coordination of international activities through the NRDC and NSDD networks was seen as a vital part of the NDS work.

Consultants Meeting (CM) on Development of a recommended library for atomic, molecular and plasma-material interaction processes in fusion Vienna, Austria, June 20 - 22, 2012

Scientific Secretary: Bas Braams, 7 participants and IAEA staff



Participants of the CM on Development of a Recommended Library for Atomic, Molecular and Plasma-Material Interaction Processes in Fusion

The A+M Data Unit is responsible for the development and maintenance of internationally validated and recommended data for atomic, molecular and plasma-material interaction (A+M+PMI) processes in fusion. In carrying out this work the unit coordinates an international A+M Data Centres Network (DCN). At their meeting in 2011 members of the DCN agreed that data evaluation needs new impetus and it should be coordinated by the A+M Data Unit. The purpose of the CM was to advise the unit about strategy for evaluation of theoretical data in general

and of A+M collision data and PMI data in particular and for coordinating the establishment of a standard library of atomic, molecular and plasma-material interaction data for fusion. The meeting clarified the need to focus attention on uncertainty assignments for calculated A+M collision data. It is apparent that uncertainty assignments for A+M structure data are in relatively good shape, largely because of the availability of accurate benchmarks from spectroscopic experiments. In A+M scattering experiments it is generally not possible to resolve excited states in the incoming or outgoing channels and these excited states are crucial for modelling. Therefore the database for collision cross sections is almost entirely based upon calculations, with experiment available only for pointwise checks of total cross-sections. The meeting also gave attention to data for plasma-material interaction processes, but for that class of processes the evaluation of uncertainties is seen to be even more difficult than for atomic and molecular collisions; the precise characterization of the surface conditions is a huge problem. Following the meeting we are developing a detailed inventory of data sets that are used in the fusion community for A+M+PMI processes and of priorities for data evaluation as seen by the community. We are also encouraged to consider future code comparison workshops such as the series on non-local thermodynamic equilibrium atomic physics (most recently NLTE-7, 5-9 December 2011 in Vienna, http://nlte.nist.gov/NLTE7/) and the one on spectral lineshapes in plasma (SLSP, 2-5 April 2012 in Vienna, http://plasma-gate.weizmann.ac.il/slsp/). The Joint IAEA-NFRI meeting in Daejeon (see page 8) represents our main effort to give new impetus to data evaluation.

2nd Research Cordination Meeting (RCM) on Spectroscopic and Collisional Data for Tungsten from 1 eV to 20 keV Heidelberg, Germany, August 29 - 31, 2012

Scientific Secretary: Bas Braams, 21 participants and IAEA staff
(hosted by Max Planck Institute for Nuclear Physics (MPIK))



Participants of the 2nd RCM on Spectroscopic and Collisional Data for Tungsten from 1 eV to 20 keV

Tungsten (symbol W, atomic number 74) is the leading candidate for use as wall material in the regions of high heat and particle flux in a fusion reactor and it is used in the divertor in ITER. However, as an impurity in the plasma, tungsten poses severe problems due to its high radiation efficiency. Even in the core plasma at a temperature of 15-20 keV it does not become fully stripped; instead it is predominantly a neon-like ion. Its properties as a wall material and as an impurity are of great interest and are the subject of present fusion experiments and of numerical simulation. The CRP was created to generate fundamental experimental and calculated data for radiative and collisional atomic processes involving tungsten ions interacting with plasma. The meeting location at the MPIK in Heidelberg was chosen because the big Highly Charged Ions conference, HCI-2012, was being held in Heidelberg the following week and many of the CRP participants attended that meeting as well; furthermore one of the CRP participants undertakes experiments on the ion storage ring at the MPIK. New work on data for tung-

sten over the past two years was presented including experimental work on spectroscopy of low-charged ions, very accurate crossed and merged beam collision cross-section measurements, precise electron beam ion trap (EBIT) data for intermediate and highly charged W, and computational work across all charge states. The third and final RCM of this CRP is expected to take place in 2014.

Joint IAEA-NFRI Technical Meeting (TM) on Data Evaluation for Atomic, Molecular and Plasma Material Interaction Processes in Fusion Daejeon, Republic of Korea, September 4 - 7, 2012

Scientific Secretary: Hyun Chung, Local Organizer Jung-Sik Yoon, 25 participants and IAEA staff
(hosted by the National Fusion Research Institute (NFRI, Republic of Korea) in conjunction with the 8th Symposium on Standard Reference Data organized by the Korea Research Institute of Standards and Science (KRISS))



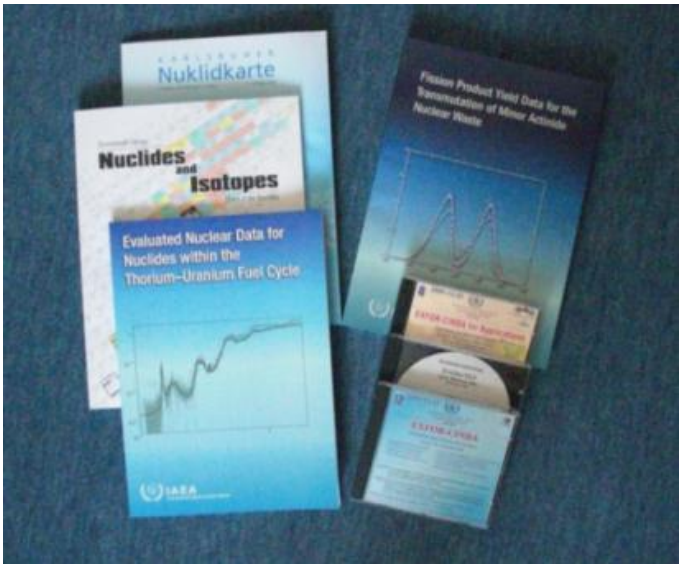
Participants of the Joint IAEA-NFRI Technical Meeting (TM) on
Data Evaluation for Atomic, Molecular and Plasma Material Interaction Processes in Fusion

The meeting objectives were to discuss the various aspects of the critical assessment and evaluation of atomic, molecular and plasma-material interaction data used in fusion and other plasma applications. This meeting is the third in the series of meetings on data evaluation activities organized by the A+M Data Unit in 2012, upon recommendation from the IAEA Data Centre Network. The topics of presentations and technical discussions included:

- Current Status of Evaluated Databases.
- Data Evaluation Methods.
- Error Propagation and Sensitivity Analysis.
- Theoretical Data Evaluation and Uncertainty Estimates.
- Experimental Data Evaluation and Semi-Empirical Fits.
- Evaluation Activities of Data Centres.

This meeting was highly successful in bringing a wider consensus and recommendations from the community of data producers for data evaluation; the work plans and the roadmap towards the evaluated and recommended data sets by the community were established.

Selected Charts, Reports and Documents



All INDC series reports are available online:

http://www-nds.iaea.org/publications/indc_groups.php

Recent Releases:

INDC(NDS)-0572 Summary Report of an IAEA Technical Meeting, 17th Meeting of the IFRC Subcommittee on Atomic and Molecular Data for Fusion, 27-28 April 2010, prepared by B.J. Braams, June 2012.

INDC(NDS)-0597 Summary Report of an IAEA Technical Meeting on Inelastic Scattering and Capture Cross-Section Data of Major Actinides in the Fast Neutron Region, Vienna, 6-9 September 2011, prepared by A. Plompen, T. Kawano, R. Capote Noy, May 2012.

INDC(NDS)-0604 Summary Report of the Second Research Coordination Meeting on Light Element Atom, Molecule and Radical Behaviour in the Divertor and Edge Plasma Regions, 23-25 May 2011, prepared by B.J. Braams, H.-K. Chung, August 2012.

INDC(NDS)-0614 Summary Report of an IAEA Consultants Meeting on Further Development of EXFOR, Vienna, 6-9 March 2012, prepared by D. Brown, S. Simakov, April 2012.

INDC(NDS)-0615 Evaluation and Compilation of Neutron/Proton-induced Fission Cross-sections for Hg, Pb, Bi, Th and U at 20 MeV to 1 GeV, prepared by S.G. Yavshits, O.T. Grudzevich, April 2012.

INDC(NDS)-0616 Summary Description of the New International Reactor Dosimetry and Fusion File (IRDFF release 1.0), prepared by E.M. Zsolnay, R. Capote Noy, H.J. Nolthenius, A. Trkov, May 2012.

INDC(NDS)-0617 Summary Report of an IAEA Consultants Meeting on Procedures for Evaluation of Atomic, Molecular and Plasma-material Interaction Data for Fusion, Toki, Japan, 7-9 February 2012, prepared by H.-K. Chung, May 2012.

INDC(NDS)-0618 Summary Report of an IAEA Technical Meeting of the International Nuclear Reaction Data Centres (NRDC), Issy-les-Molineaux, France, 16-19 April 2012, prepared by N. Otsuka, June 2012.

INDC(NDS)-0619 Report of the IAEA Nuclear Data Section to the International Nuclear Data Committee for the period January 2010 - December 2011, edited by D.H. Abriola, R.A. Forrest, April 2012.

INDC(NDS)-0620 Summary Report of the First Research Coordination Meeting on Spectroscopic and Collisional Data for Tungsten from 1 eV to 20 keV, 13-15 December 2010, prepared by B.J. Braams, H.-K. Chung, June 2012.

INDC(NDS)-0622 Summary report of an IAEA Consultants Meeting on Data Evaluation and the Establishment of a Standard Library of Atomic, Molecular and Plasma-Material Interaction Data for Fusion, 20-22 June 2012, prepared by B.J. Braams, August 2012.

INDC(NED)-011 Validation of FENDL-3/A Library Using Integral Measurements, prepared by J. Kopecky, August 2012.

INDC(JPN)-0197 Proceedings of the 2011 Symposium on Nuclear Data, November 16-17, 2011, Ricotti, Tokai, Japan, edited by Hideo Harada, Kenji Yokohama, Nobuyoki Iwamoto, Shoji Nakamura and Hiroyuki Koura, July 2012.

Also Available:

Chart of the Nuclides 2010 JAEA Nuclear Data Centre.

Chart of the Nuclides *(Wall chart) prepared by Knolls Atomic Power Laboratory (KAPL) and distributed by Lockheed Martin (17th edition, revised 2009).* Available cost-free on request only for **teachers and scientists from developing countries.**

Chart of the Nuclides *(Book) prepared by Knolls Atomic Power Laboratory (KAPL) and distributed by Lockheed Martin (17th edition, revised 2009).* Available cost-free on request only for **teachers and scientists from developing countries.**

Karlsruher Nuklidkarte *Wall chart of the nuclides, 7th edition (2006).* Available cost-free on request only for **teachers and scientists from developing countries**.

Karlsruher Nuklidkarte *Desk chart of the Nuclides, 7th edition (2006).* Available cost-free on request only for **teachers and scientists from developing countries**.

Coordinated Research Projects

IAEA Coordinated Research Projects (CRPs) are a valuable mechanism for stimulating research in IAEA Member States of relevance to the IAEA programmes. Details of the CRPs of the Nuclear Data Section, both active and recently completed, can be found at: http://www-naweb.iaea.org/napc/nd/crps.asp.

New CRP:

Beta-Delayed Neutron Emission Evaluation: The overall CRP objective is to enhance Member States' knowledge and calculational capabilities in the fields of nuclear energy, safeguards, used fuel and waste management and nuclear sciences by creating a Reference Database for Beta-Delayed Neutron Emission that contains both a compilation of existing data and recommended data, which will be made readily available to the user community. The project is due to start in 2013 and is envisioned to have a length of five years (http://www-nds.iaea.org/beta-delayed-neutron).

Technical reports detailing the outcome of IAEA-CRPs can be accessed electronically on:
http://www-pub.iaea.org/MTCD/publications/

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In Memoriam



It was with great regret we learnt that Christopher (Chris) John Dean passed away on 16th May 2012, aged 64. Chris had worked at Winfrith, initially for the United Kingdom Atomic Energy Authority, since 1964. He worked closely with John Rowlands and became a focus for UK contributions to nuclear data production, with a highly respected world-wide reputation. Chris produced the nuclear data libraries for the UK ANSWERS software suite and was a UK representative on the Joint Evaluated Fission and Fusion file scientific co-ordination committee which runs the JEFF project; he attended bi-annual meetings in Paris, presenting UK contributions to the JEFF project. He was very active in trying to ensure the continuation of many nuclear data projects in the UK. He was methodical, meticulous, extremely conscientious, highly professional, friendly, and always considerate of others. Chris was highly regarded throughout the nuclear industry world-wide, and will be greatly missed both as a colleague and a friend.

Fay Ajzenberg-Selove passed away on August 8, 2012. Fay was one of the pioneers in NSDD evaluation. In particular she is famous for the evaluation of the 'Energy levels of light nuclei A=5-20' series which were published in Nuclear Physics, with a format adequate for basic research and the understanding of the nucleosynthesis of elements in stars. She was a recipient of the US-National Medal of Science as well as a champion in the cause of opportunities for women in science. She will be greatly missed.

Staff Items

for all NDS staff details: http://www-naweb.iaea.org/napc/nd/aboutus.asp



Vivian (Paraskevi) Dimitriou, from Greece, has taken up the post of Nuclear Physicist (Codes Development) in the Nuclear Data Development Unit. She has a DPhil from Oxford University where she worked on nuclear reaction theory, in particular on pre-equilibrium reactions. Vivian has been involved in developing models and producing data for nuclear reactions at low and intermediate energies that are relevant to astrophysics, medical, space and energy applications, and more recently, at NCSR "Demokritos", Greece, focused on the development of models for nuclear properties such as optical potentials and nuclear level densities important for the description of nuclear reactions occurring in stellar environments. As the successor to Mark Kellett, Vivian will be involved in nuclear data development activities, database improvements, organization of CRPs and training workshops, as well as studies associated with the development of nuclear structure and decay data.

Intern – Nuclear Data Section

The IAEA has an internship programme that provides interns with the opportunity to gain practical work experience and which benefits the IAEA's programmes through the assistance of qualified students or recent graduates. Interns spend a minimum of one month and a maximum of one year at the IAEA. During the summer of 2012 the A+M Data Unit was host to such an intern, Dmitri Kondratyev for the months of July and August. Dmitri is a recent graduate of the Lebedev Physical Institute in Moscow where he studied atomic physics. He developed and installed for us a small database of calculated cross-sections based on the ATOM code and compared them with more detailed quantum mechanical calculations. The experience was valuable for all concerned and we are interested in having interns again in future years.

Forthcoming Event

The 20th Network meeting of the NSDD network will be held at the Kuwait Nuclear Data Center, Physics Department, Kuwait University, Kuwait, from January 27-31, 2013.

This newsletter, as well as previous issues, can be accessed electronically at:
http://www-pub.iaea.org/books/IAEABooks/View_Newsletters/60/Nuclear-Data-Newsletter

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For information regarding on-line services, contact: B. Pritychenko: pritychenko@bnl.gov
For information regarding general NNDC services, contact: M. Blennau: blennau@bnl.gov

For services to customers in OECD/NEA Data Bank member countries:
NEA Data Bank, OECD Nuclear Energy Agency, Le Seine Saint-Germain, 12 blvd des Iles,
F-92130 Issy-les-Moulineaux, France.
Tel. +33 1 4524 (plus extension); Fax +33 1 45241110;
Email: Emmeric.Dupont@oecd.org or db@nea.fr; Worldwide Web: http://www.oecd-nea.fr/databank/ contact: E. Dupont, ext. 1084.

For services to the customers from the former USSR:
Neutron data: Russia Nuclear Data Center, Centr Jadernykh Dannykh (CJD), Fiziko-Energeticheskij Institut, Ploschad Bondarenko,
249020 Obninsk, Kaluga Region, Russian Federation.
Tel. +7 08439-9-8982; Fax +7 095-230-2326;
Email: blokhin@ippe.ru; Worldwide Web: www.ippe.ru/podr/cjd/; contact: A.I. Blokhin.
Charged-particle data: Russia Nuclear Structure and Reaction Data Center (CAJAD), Kurchatov Institute,
Kurchatov Square 1, 123 182 Moscow, Russian Federation.
Tel. +7 095-196-9968; Fax +7 095-882-5804;
Email: sbabykina@polyn.kiae.su; contact: S. Babykina.
Photonuclear data: Centre for Photonuclear Experiments Data, Centr Dannykh Fotoyadernykh Eksperimentov (CDFE),
Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Leninskie Gory, 119 922 Moscow, Russian Federation.
Tel. +7 495-939-3483; Fax +7 495-939-0896;
Email: varlamov@depni.sinp.msu.ru or varlamov@depni.npi.msu.su; Worldwide Web: http://cdfe.sinp.msu.ru/; contact: V.V. Varlamov.

For services to customers in China:
China Nuclear Data Center, China Institute of Atomic Energy, P.O. Box 275(41), Beijing 102413, China.
Tel. +86 10-6935-7275; Fax +86 10-6935-7008; Email: gezg@ciae.ac.cn; contact: Ge Zhigang.

Computer codes of US origin to all countries (there are charges and release restrictions):
Radiation Safety Information Computational Center (RSICC), Oak Ridge National Laboratory,
P.O. Box 2008, Oak Ridge, TN 37831-6362, USA.
Tel. +1 865-574-6176; Fax +1 865-574-6182;
Email: pdc@ornl.gov Worldwide Web: http://rsicc.ornl.gov/CustomerService.aspx

Computer codes of non-US origin to all countries (there may be release restrictions):
NEA Data Bank (see above)
Email: Juan.Galan@oecd.org; contact: J. Galan, ext. 1008.

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Users in India and neighbouring countries may use
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Impressum

Nuclear Data Newsletter, No. 54, November 2012

The Nuclear Data Newsletter is prepared by the Division of Physical and Chemical Sciences, Department of Nuclear Sciences and Applications

International Atomic Energy Agency
Vienna International Centre, PO Box 100, 1400 Vienna, Austria
Printed by the IAEA in Austria, November 2012

12-41651 2