

IAEA Nuclear Data Section: Progress Report for period 2014/15

Summary of Nuclear Data Activity by Staff of the IAEA Nuclear Data Section May 2014 – March 2015

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1. Staff Changes

The authorized staff level of the Nuclear Data Section (NDS) consists of a total of 16.25 professionals and support staff. The latest staff changes include:

- Kira Nathani (Nuclear Data Services Assistant of Nuclear Data Service Unit) re-joined on 1 July 2014.
- Ann Jensby (Team Assistant of Nuclear Data Development Unit) took a reassignment in Secretariat of the Policy-making Organs on 1 April 2015.
- Malgorzata Rydeng (Team Assistant of Nuclear Data Development Unit) joined on 1 April 2015.
- Robin Forrest (Section Head) is planning to retire on 30 June 2015.
- Stanislav Simakov (Unit Head of Nuclear Data Services Unit) is planning to retire on 31 October 2015.
- Benjaminas Marcinkevicius (Intern, Nuclear Data Services Unit) joined on 1 September 2014 and will leave on 15 May 2015.
- Lidija Vrapcenjak (Nuclear Data Services Assistant of Nuclear Data Service Unit) is on an extended leave

2. Compilations

2.1 EXFOR transmission

During the reporting period, the following final tapes have been transmitted:

- 6 neutron final TRANS tapes (3163 – 3168) containing 46 new entries and 65 revised entries;
- 5 CPND final TRANS tapes (D094 - D097, S018) containing 65 new entries and 41 revised entries;
- 3 PhND final TRANS tapes (G029 - G031), containing 16 new entries and 8 revised entries.

These include contributions from ATOMKI, CNDC, KNDC, NDPCI, UkrNDC and KazNU as well as Dr Myagmarjav Odsuren (See **Table 1**).

Dr. Odsuren (National Univ. of Mongolia, Ulaanbaatar, a former JCPRG EXFOR compiler) compiled heavy-ion induced reaction data measured in area 2 countries (i.e., Italy) for area D.

Also 61 final TRANS tapes have been received at NDS. These final TRANS tapes contain 121 neutron entries (46 new, 65 revised), 106 CPND entries (65 new, 41 revised), 24 PhND entries (16 new, 8 revised) during the reporting period.

Based on these finalized TRANS tapes, 12 EXFOR Master Files have been created and distributed.

Two regular transmissions of the EXFOR/CINDA dictionaries (TRANS.9109 - 9110) were done in TRANS, DANIEL (backup) and archive format.

Table 1: Number of new entries transmitted by final tapes in May 2014 - April 2015

(KAS: Kazakh and Uzbek Group coordinated by Nurzat Kenzhebayev, Kaz National Univ.;
MON: Myagmarjav Odsuren of National Univ. of Mongolia)

	NDS	ATOMKI	CNDC	KNDC	NDPCI	UkrNDC	KAS	MON	Sum
Neutron	13	-	10	0	19	1	3	-	46
CPND	17	10	16	2	4	4	3	9	65
PhND	5	-	-	1	0	9	1	-	16
Sum	35	10	26	3	23	14	7	9	127

2.2 EXFOR quality control

During the reporting period, 59 preliminary TRANS tapes were transmitted for checking by NDS and other centres. Both ZCHEX and JANIS TRANS Checker are regularly used. The finalized tapes are also checked against comments from centres before uploading to the NDS open area. NDS has also registered comments on EXFOR entries from users and centres to the EXFOR Feedback List (<https://www-nds.iaea.org/nrdc/error/>) and monitored the correction process by checking each preliminary TRANS tape against the feedback list.

2.3 EXFOR coverage control

Under the EXFOR compilation control system, about 70 journal titles are regularly scanned and registered to the EXFOR Compilation Control System. The list of newly published articles for compilation (<https://www-nds.iaea.org/exfor-master/x4compil/>) is updated every week. Since the last NRDC Meeting, about 750 journal issues have been scanned and added to the database for EXFOR compilation control system.

Completeness checking of EXFOR against prompt fission neutron multiplicities and their distributions was performed against Norman Holden's compilation (Memo CP-D/867 and 871).

2.4 Workshops and meetings relevant to EXFOR held and planned

- Workshop on EXFOR Compilation, 6 - 10 October 2014, Vienna, Scientific Secretary: V. Semkova). See https://www-nds.iaea.org/nrdc/wksp_2014/ for presentations etc.

2.5 CINDA

The CINDA Master File is available via the NDS compilers' Web site (includes all components and history). Automatic updates using the EXFOR and NSR databases have been carried out twice (July 2014, December 2014). Complete MySQL CINDA database was sent to NNDC (USA), BARC (India) and CNDC (China).

2.6 Evaluated data libraries, files and programs

Various new and revised evaluated data libraries, files and programs for data checking, processing and graphical presentation were added, developed and distributed via the NDS Web site and on DVD-ROM (see below).

3. Services

3.1 Web Services

Further improvements have been implemented in the Web EXFOR-CINDA-ENDF-IBANDL retrieval systems since the last NRDC meeting:

- ENDF (Evaluated Nuclear Data Files):
 - ENDF-Archive: collection of evaluated data libraries (60) for FTP downloading: <http://www-nds.iaea.org/ndspub/download-endf/>
 - New evaluated libraries included in the ENDF database:
 - IRDFF-1.05: International Reactor Dosimetry and Fusion File, IAEA, 2015
 - JENDL-4.0u2: update 20150122 of Japanese evaluated nuclear data library 2010
 - TENDL-2014: TALYS-based Evaluated Nuclear Data Library, 2014
 - Plotting covariance and cross section data with uncertainties for energy distributions of secondary particles (MF35 and MF5)
 - On-line conversion ENDF data to GND format (using LLNL package Fudge)
- EXFOR:
 - Database of expert's corrections to EXFOR data with Web interface
 - Text search "a la Google" in extended EXFOR
 - Online calculation of cross sections for inverse reactions using detailed balance relation (output: C5, C4, plots)
 - 23 updates of PDF part of NDS EXFOR database were done; common PDF collection with NSR database: 6 updates (for authorized users only)
- IBANDL:
 - Web interface for IBANDL was extended by calculating of data for inverse kinematics. It is available for IBANDL data, SigmaCalc data (local and remote) and uploaded users' data. Output: R33 files, plotting data and reaction schema, data table
 - New features: converting users' data from cross sections to Rutherford ratios and back; calculating data in center of mass and inverse kinematics

News in Web-Tools for EXFOR compilers and ENDF/ENSDF evaluators:

- ENDF uploading system: PREPRO code for pre-processing was upgraded to the version-2015; GRUCON processing package was installed and prepared for Web calculations
- ENSDF uploading system: BrIcc, chk_ENSDF, sPrepro were added; Web-tools for publication was extended by editing and administrating functions

Common IAEA Web statistics on Google-Analytics was implemented on NDS Mirror sites.

The Web EXFOR-CINDA-ENDF retrieval system is functioning at NNDC (USA), BARC (India) and CNDC (China). Statistics for usage of the Web retrieval system are presented in figures below.

3.2 DVD-ROM

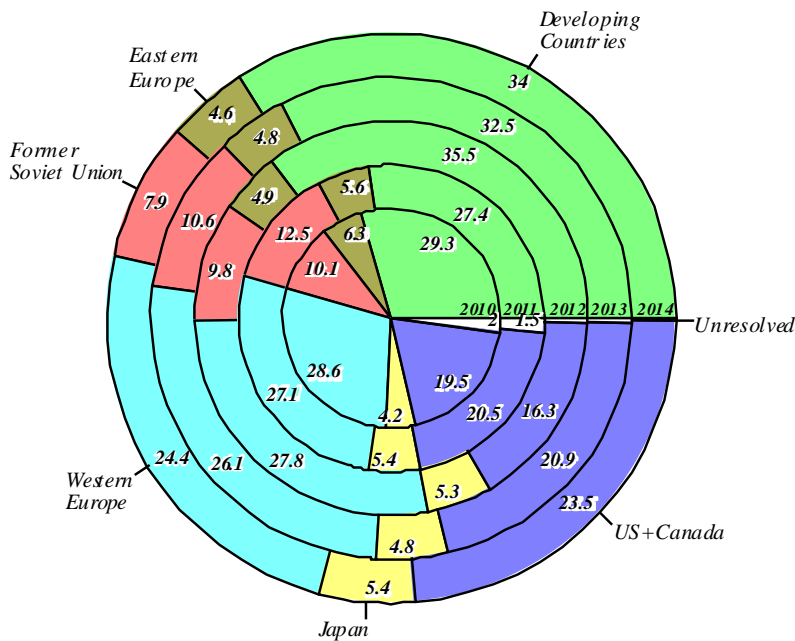
Most of NDS CD/DVD-ROMs are available via Web distribution (15 from 24). Important exception: DVD “Nuclear reaction libraries, database retrieval systems and applications” is distributed by post – it contains:

- EXFOR/CINDA for Windows
- EXFOR/CINDA for Applications (Linux, Windows and Mac OSX)
- EndVer/GUI with Prepro-2012 (Linux, Windows and Mac OSX)
- ENDF Libraries (32)

IAEA Nuclear Data Services: Web Statistics

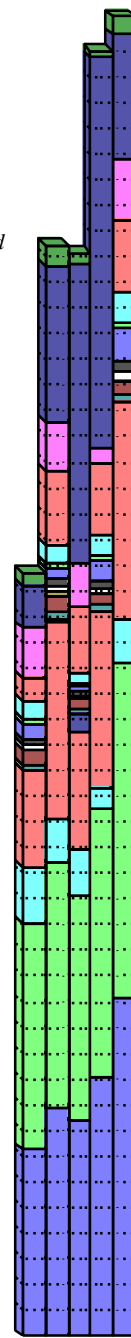
2010-2014

Geographical Distribution (%)

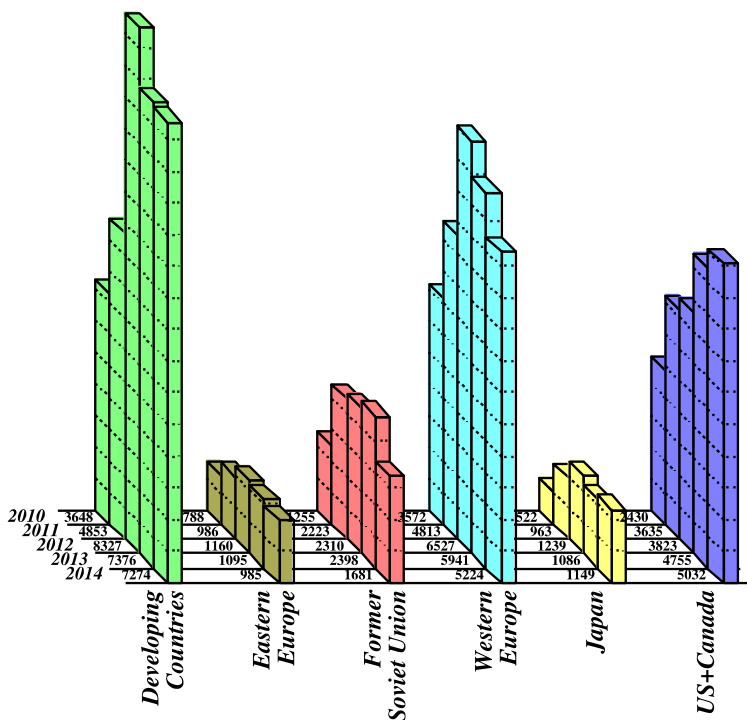


Total per Year* (Number of accesses + retrievals)

*2012: 9 Months
*2013: 11 Months



Average per Month (Number of accesses + retrievals)



- | Service | Comment |
|------------------------|--------------|
| Computer Codes | |
| Documents | |
| OtherData | |
| IBANDL | |
| PGAA | |
| PhotoNuclear | |
| RIPL | Theory |
| FENDL | Fusion |
| Masses | |
| IRDF | Dosimetry |
| Thermal Capture | |
| Wallet Cards | |
| Med.Radioisotope.Prod. | |
| NGAtlas | Activation |
| RNAL | |
| ENSDF | Structure |
| MIRD | Medical |
| NuDat/LiveChartNucl | |
| CINDA+NSR Bibliography | |
| EXFOR | Experimental |
| ENDF | Energy |

3.3 Code Services

The following new or recently updated codes have been made publically available on the NDS web page since the last NRDC meeting:

- **PREPRO** - collection of 18 computer codes, which are designed to convert ENDF/B formatted neutron and/or photon data from the originally distributed form to ones used in applications. The latest version PREPRO-2015 available on <https://www-nds.iaea.org/public/endl/prepro/>.
- **LARELKIN** - Two-body relativistic kinematics code. The recently updated version (<https://www-nds.iaea.org/public/libraries/larelkin/>) uses the input masses from Atomic Mass Evaluation 2012.
- **STAYSL PNNL** - set of tools for working with the measured neutron activation rates to determine the neutron flux spectrum. The new beta version of software is based on the neutron cross sections in IRDF V1.05 and extends to 60 MeV (<https://www-nds.iaea.org/irdf2002/codes/index.htmlx>). This beta version has not completed whole software verification and validation process yet. Consequently, the prior version based on IRDF2002 to 20 MeV is provided for users requiring fully verified and validated software for their applications.

Also NDS of IAEA has reached an official agreement with Nuclear Research Centre “Kurchatov Institute” (Moscow, Russia) on delivering and usage of **GRUCON-D** software package (written by V. Sinitza, A. Rineyski, M. Malkov, Russia, 1980-2014) for processing of evaluated data files. The package is installed and tested as an on-line processing tool on the NDS web (ENDF uploading system - see Section 3.2).

3.4 Document Services

Nuclear Data Services Unit (NDSU) continued supporting the Member States in providing the reports published, as well as distributing data libraries on CDs and DVDs as requested. Following the trends, most of data libraries which are available from CDs/DVDs are now also available from webpage (<https://www-nds.iaea.org/cdroms/>) for download to ensure quicker and easier service.

NDSU continues supporting the compilers around the world by collecting references required for compilation and research work as the availability of source articles is important for EXFOR quality control by NDS. NDSU also published an INDC country report (INDC(AUS)-0019) prepared with Manfred Drosig to provide unpublished information to EXFOR compilers and users. Also papers presented by data centres and other laboratories in the "5th AASPP Workshop on Nuclear Reaction Database (Mumbai, 22 - 24 September 2014)" were edited with Alok Saxena, and published as INDC(IND)-0048.

Any other improvement suggestions should be sent to our contact address (nds.contact-point@iaea.org).

3.5 Nuclear Data Newsletters

The Nuclear Data Newsletter is published biannually to inform the scientific community about actual NDS work: # 57 was issued in May 2014; # 58 was issued in November 2014; #59 is in preparation and will be published in May 2015. Distribution: 133 on-line and hard copies upon request.

4. Visits and Inter-centre Cooperation

- V. Zerkin (NDS) visited NNDC from 18 August to 5 September 2014 to deploy and further develop software for the management and the web retrieval of ENDF, EXFOR and CINDA databases. Collaborative work on the development of XML for EXFOR and ENDF data formats.
- N. Otsuka (NDS) visited CNDC from 17 to 21 November 2014 to finalize EXFOR entries compiled from old articles published in Chinese journals (e.g., Chinese Journal of Nuclear Physics, High Energy Physics and Nuclear Physics).

5. Nuclear Data Developments

The Nuclear Data Section undertakes long term nuclear data development by implementing Coordinate Research Projects (CRP) and Data Development Projects (DDP). The staff members of NDS who manage NRDC also follow the currently running CRPs and DDPs to observe the actual trends and needs for nuclear reaction data.

5.1. On-going Coordinated Research Projects (CRPs) Meeting Held and Planned:

- Development of a Reference Database for Particle-induced Gamma Ray Emission (PIGE) Spectroscopy (2011-2015): 3rd RCM on 7 - 11 April, 2014;
- Nuclear Data for Charged-particle Monitor Reactions and Medical Isotope Production (2012-2016): 2nd RCM on 8-12 December, 2014;
- International Reactor Dosimetry Library for Fission and Fusion (IRDF) Testing and Validation (2013-2017): 2nd RCM on 16 - 20 March 2015;
- Reference Database for Beta-delayed Neutron Emission Evaluation (2013-2017): 2nd RCM on 23 - 27 March 2015;
- Primary Radiation Damage Cross Sections (2013-2017): 2nd RCM on 29 June - 2 July, 2015;
- Recommended Input Parameters for Fission Cross-Section Calculations (2015 - 2018): 1st RCM, 20 -24 July 2015

5.2. Data Development Projects (DDP) Meeting Held and Planned:

- Structure and Decay Data:
TM on "Improvement of Codes used for NSDD Evaluations" on 10 - 13 June 2014
CM on "Total Absorption Gamma-ray Spectroscopy (TAGS)" on 15 - 17 December 2014
TM on "Nuclear Structure and Decay Data Network" on 20 - 24 April 2015
WS on "Nuclear Structure and Decay Data Evaluation (NSDD)" on 27 -29 April 2015
- International neutron cross section Standards file and evaluation techniques:
TM on "Current Status of Neutron Standards", 1-5 December 2014.
- Ion Beam Analysis Nuclear Data Library (IBANDL):
TM on "Ion Beam Analysis (IBA) Benchmarking Experiments" on 26 - 29 May 2015
CM on "Codes for charged Particle Resonance Evaluation", on 6 - 8 July 2015

- CIELO collaboration: coordination and technical work:
CM on "Inelastic Scattering Data of Major Actinides" on 22 - 23 June 2015
CM on "Working meeting on CIELO evaluation of Actinides" on 14 - 18 September 2015
- Evaluated Data Processing:
CM on Toward a new evaluated Nuclear Data File processing capabilities on 12 - 16 October 2015
- Experimental Data (EXFOR):
CM on "Experimental Nuclear Reaction Data (EXFOR) Compilation of Thermal Neutron Scattering Data", 2 - 4 November 2015

5.3. Training Activities (Schools, Workshops) Held and Planned:

- Joint ICTP-IAEA Workshop "Nuclear Data for Neutron Dosimetry and Analytical Methods on Research Reactors", 20 -24 April 2015, Trieste
- Joint ICTP-IAEA School on "Nuclear Data Measurements for Science and Applications in Collaboration with n_TOF/CERN", 19 - 23 October 2015, Trieste.

6. Nuclear Data Journal Publications (2014-2015)

Production cross-sections of long-lived radionuclides in deuteron-induced reactions on natural zinc up to 23 MeV

M.U. Khandaker, H. Haba, M. Murakami, N. Otuka, Nucl. Instrum. Meth. B **346** (2015) pp. 8-16.

Definitions of radioisotope thick target yields

N. Otuka and S. Takács, Radiochim. Acta **103** (2015) pp. 1-6.

Recent Work Leading Towards a New Evaluation of the Neutron Standards

A.D. Carlson, V.G. Pronyaev, R. Capote, G.M. Hale, F.-J. Hambsch, T. Kawano, S. Kunieda, W. Mannhart, R.O. Nelson, D. Neudecker, P. Schillebeeckx, S. Simakov, D.L. Smith, P. Talou, X. Tao, A. Wallner, W. Wang, Nucl. Data Sheets **123** (2015) pp. 27–35.

Measurement and analysis of the ^{243}Am neutron capture cross section at the n_TOF facility at CERN

E. Mendoza et al., (n_TOF Collaboration) Phys. Rev. C **90** (2014) 034608.

Uncertainties of mass extrapolations in Hartree-Fock-Bogoliubov mass models

S. Goriely, R. Capote, Phys. Rev. C **89** (2014) 054318.

Neutron-induced fission cross section of ^{234}U measured at the CERN n_TOF facility

R. Sarmiento et al., (n_TOF Collaboration), Phys. Rev. C **89** (2014) 044606.

Nuclear data for medical applications – Recent developments and future requirements

A.L. Nichols, R. Capote, Nucl. Data Sheets **120** (2014) pp. 239–241.

Measurement of the MACS of $^{159}\text{Tb}(n,\gamma)$ at $kT = 30\text{ keV}$ by activation

J. Praena, P.F. Mastinu, M. Pignatari, J.M. Quesada, R. Capote, Y. Morilla, Nucl. Data Sheets **120** (2014) pp. 205–207.

EMPIRE: A reaction model code for nuclear astrophysics

A. Palumbo, M. Herman, R. Capote, Nucl. Data Sheets **120** (2014) pp. 180–183.

Evaluation of neutron resonance cross section data at GELINA

P. Schillebeeckx, B. Becker, R. Capote, F. Emiliani, K. Guber, J. Heyse, K. Kauwenberghs, S. Kopecky, C. Lampoudis, C. Massimi, W. Mondelaers, M. Moxon, G. Noguere, A.J.M. Plompen, V. Pronyaev, P. Siegler, I. Sirakov, A. Trkov, K. Volev, G. Zerovnik, Nucl. Data Sheets **119** (2014) pp. 94–97.

Study of $^{234}\text{U}(n,f)$ resonances measured at the CERN n_TOF facility

E. Leal-Cidoncha, et al. (n_TOF Collaboration), Nucl. Data Sheets **119** (2014) pp. 42–44.

Evaluation of the covariance matrix of estimated resonance parameters

B. Becker, R. Capote, S. Kopecky, C. Massimi, P. Schillebeeckx, I. Sirakov, K. Volev, Nucl. Data Sheets **118** (2014) pp. 381–383

Exclusive multiple emission cross sections in the hybrid Monte Carlo pre-equilibrium model and in EMPIRE-3.1

B.V. Carlson, L. Brito, D.F. Mega, R. Capote, M. Herman, M.E. Rego, Nucl. Data Sheets **118** (2014) pp. 276–279.

Rotational-vibrational description of nucleon scattering on actinide nuclei using a dispersive coupled-channel optical model

J.M. Quesada, R. Capote, E.Sh. Soukhovitskiĭ, S. Chiba, Nucl. Data Sheets **118** (2014) pp. 270–272.

Fitting prompt fission neutron spectra using Kalman filter integrated with Empire code

G.P.A. Nobre, M. Herman, S. Hoblit, A. Palumbo, R. Capote, A. Trkov, Nucl. Data Sheets **118** (2014) pp. 224–226.

A fully Lane-consistent dispersive optical model potential for even Fe isotopes based on a soft-rotator model

W. Sun, R. Li, E.Sh. Soukhovitskiĭ, J.M. Quesada, R. Capote, Nucl. Data Sheets **118** (2014) pp. 191–194.

Fluctuations above the resonance range in evaluated data of ^{55}Mn

A. Trkov, R. Capote, L.C. Leal, D.W. Muir, E.Sh. Soukhovitskiĭ, Nucl. Data Sheets **118** (2014) pp. 161–164.

Zirconium evaluations for ENDF/B-VII.2 for the fast region

D.A. Brown, R. Arcilla, R. Capote, S.F. Mughabghab, M.W. Herman, A. Trkov, H.I. Kim, Nucl. Data Sheets **118** (2014) pp. 144–146.

Physics of neutron interactions with ^{238}U : New developments and challenges

R. Capote, A. Trkov, M. Sin, M. Herman, A. Daskalakis, Y. Danon, Nucl. Data Sheets **118** (2014) pp. 26–31

Elastic and inelastic scattering of neutrons on ^{238}U nucleus

R. Capote, A. Trkov, M. Sin, M.W. Herman, E.Sh. Soukhovitskiĭ, EPJ Web of Conf. **9** (2014) 00008.

Quasi-differential neutron scattering from ^{238}U from 0.5 to 20 MeV

A.M. Daskalakis, R.M. Bahrán, E.J. Blain, B.J. McDermott, S. Piela, Y. Danon, D.P. Barry, G. Leinweber, R.C. Block, M.J. Rapp, R. Capote, A. Trkov, *Ann. Nucl. Energy* **73** (2014) pp. 455-464

Recent Developments in the Experimental Nuclear Reaction Data Library EXFOR

V. Semkova, N. Otuka, S. Simakov, V. Zerkin, *EPJ Web of Conf.* **66** (2014) 03078.

Measurement of Neutron Activation Cross Sections on Mo isotopes in the Energy Range from 7 MeV to 15 MeV

Valentina Semkova, Ralf Nolte, *EPJ Web of Conf.* **66** (2014) 03077.

Quality Assurance of the Cross-sections Measured on p+Li/C Source

M. Majerle, P. Bém, J. Novák, E. Šimečkova, M. Štefánek, S. Simakov, and U. Fischer, *Nucl. Data Sheets* **119** (2014) pp. 425-428.

The Neutrons for Science Facility at SPIRAL-2

X. Ledoux, M. Aïche, M. Avrigeanu, V. Avrigeanu, L. Audouin, E. Balanzat, B. Ban-détat, G. Ban, G. Barreau, E. Bauge, G. Bélier, P. Bem, V. Blideanu, C. Borcea, S. Bouffard, T. Caillaud, A. Chatillon, S. Czajkowski, P. Dessagne, D. Doré, M. Fallot, F. Farget, U. Fischer, L. Giot, T. Granier, S. Guillous, F. Gunsing, C. Gustavsson, B. Jacquot, K. Jansson, B. Jurado, M. Kerveno, A. Klix, O. Landoas, F.R. Lecolley, J.L. Lecouey, M. Majerl, N. Marie, T. Materna, J. Mrazek, F. Negoita, J. Novak, S. Oberstedt, A. Oberstedt, S. Panebianco, L. Perrot, A.J.M. Plompen, S. Pomp, J.M. Ramillon, D. Ridikas, B. Rossé, G. Rudolf, O. Serot, S.P. Simakov, E. Simeckova, A.G. Smith, J.C. Sublet, J. Taieb, L. Tassan-Got, D. Tarrío, A. Takibayev, I. Thfoin, I. Tsekhanovich, and C. Varignon, *Nucl. Data Sheets* **119** (2014) pp. 353-356.

The CIELO Collaboration: Neutron Reactions on ^1H , ^{16}O , ^{56}Fe , $^{235,238}\text{U}$, and ^{239}Pu

M.B. Chadwick, E. Dupont, E. Bauge, A. Blokhin, O. Bouland, D.A. Brown, R. Capote, A. Carlson, Y. Danon, C. De Saint Jean, M. Dunn, U. Fischer, R.A. Forrest, S.C. Frankle, T. Fukahori, Z. Ge, S.M. Grimes, G.M. Hale, M. Herman, A. Ignatyuk, M. Ishikawa, N. Iwamoto, O. Iwamoto, M. Jandel, R. Jacqmin, T. Kawano, S. Kunieda, A. Kahler, B. Kiedrowski, I. Kodeli, A.J. Koning, L. Leal, Y.O. Lee, J.P. Lestone, C. Lubitz, M. MacInnes, D. McNabb, R. McKnight, M. Moxon, S. Mughabghab, G. Noguere, G. Palmiotti, A. Plompen, B. Pritychenko, V. Pronyaev, D. Rochman, P. Romain, D. Roubtsov, P. Schillebeeckx, M. Salvatores, S. Simakov, E.Sh. Soukhovitskiĭ, J.C. Sublet, P. Talou, I. Thompson, A. Trkov, R. Vogt, and S. van der Marck, *Nucl. Data Sheets* **118** (2014) pp. 1-25.

Working Party on International Nuclear Data Evaluation Cooperation (WPEC)

E. Dupont, M.B. Chadwick, Y. Danon, C. De Saint Jean, M. Dunn, U. Fischer, R.A. Forrest, T. Fukahori, Z. Ge, H. Harada, M. Herman, M. Igashira, A. Ignatyuk, M. Ishikawa, O. Iwamoto, R. Jacqmin, A.C. Kahler, T. Kawano, A.J. Koning, L. Leal, Y.O. Lee, R. McKnight, D. McNabb, R.W. Mills, G. Palmiotti, A. Plompen, M. Salvatores, and P. Schillebeeckx, *Nucl. Data Sheets* **118** (2014) pp. 264-267.

Deuteron-induced activation cross-sections on natural copper up to 24 MeV

M.U. Khandaker, H. Haba, M. Murakami, N. Otuka, H.A. Kassim, *J. Radioanal. Nucl. Chem.* **302** (2014) pp. 759-764.

Activation cross-sections of deuteron-induced nuclear reactions on natural titanium
M.U. Khandaker, H. Haba, J. Kanaya, N. Otuka, H.A. Kassim, Nucl. Data Sheets **119** (2014) pp. 252-254.

Documentation of uncertainties in experimental cross sections for EXFOR
N. Otuka, D.L. Smith, Nucl. Data Sheets **120** (2014) pp. 281-284.

First Compilation and Evaluation of Beta-Delayed Neutron Emission Probabilities and Associated Half-Lives for $A \leq 72$ Nuclei
M. Birch, B. Singh, D. Abriola, I. Dillmann, T.D. Johnson, E.A. McCutchan, and A.A. Sonzogni, Nucl. Data Sheets **120** (2014) pp. 66–69.

A New Approach to Estimating the Probability for β -delayed Neutron Emission
E.A. McCutchan, A.A. Sonzogni, T.D. Johnson, D. Abriola, M. Birch, and B. Singh, Nucl. Data Sheets **120** (2014) pp. 62–65.

Towards a More Complete and Accurate Experimental Nuclear Reaction Data Library (EXFOR): International Collaboration Between Nuclear Reaction Data Centres (NRDC)
N. Otuka, E. Dupont, V. Semkova, B. Pritychenko, A.I. Blokhin, M. Aikawa, S. Babykina, M. Bossant, G. Chen, S. Dunaeva, R.A. Forrest, T. Fukahori, N. Furutachi, S. Ganesan, Z. Ge, O.O. Gritzay, M. Herman, S. Hlavač, K. Katō, B. Lalremruata, Y.O. Lee, A. Makinaga, K. Matsumoto, M. Mikhaylyukova, G. Pikulina, V.G. Pronyaev, A. Saxena, O. Schwerer, S.P. Simakov, N. Soppera, R. Suzuki, S. Takács, X. Tao, S. Taova, F. Tárkányi, V.V. Varlamov, J. Wang, S.C. Yang, V. Zerkin, Y. Zhuang, Nucl. Data Sheets **120** (2014) pp. 272–276.

Developments of the EXFOR Database: Possible New Formats
R.A. Forrest, V. Zerkin, S. Simakov, Nucl. Data Sheets **120** (2014) pp 268–271.

Inventory Simulations Under Neutron Irradiation: Visualization Techniques as an Aid to Materials Design
M.R. Gilbert, L.W. Packer, J.-Ch. Sublet, and R.A. Forrest, Nucl. Sci. Eng. **177** (2014) pp. 291–306.

Investigation of (d,x) nuclear reactions on natural ytterbium up to 24 MeV
M.U. Khandaker, H. Haba, N. Otuka, A.R. Usman, Nucl. Instrum. Meth. Phys. Res. B **335** (2013) pp. 8-18.

Improvements and Extensions of the Neutron Cross Section and Fluence Standards
A.D. Carlson, V.G. Pronyaev, R. Capote, F.-J. Hamsch, F. Käppeler, C. Lederer, W. Mannhart, A. Mengoni, R.O. Nelson, A.J.M. Plompen, P. Schillebeeckx, S. Simakov, P. Talou, S. Tagesen, H. Vonach, A. Vorobyev, and A. Wallner, Nucl. Data Sheets **118** (2014) pp. 126-131.

Validation of the International Reactor Dosimetry and Fusion File
S. Simakov, L. Greenwood, R. Capote Noy, Progress in Nucl. Sci. Technol. **4** (2014) pp. 591-595.