IAEA Nuclear Data Section: Progress Report for period 2024-2025

Summary of Nuclear Data Activity by Staff of the IAEA Nuclear Data Section
May 2024 – May 2025

IAEA Technical Meeting, 17-20 June 2025
Vienna, Austria

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1. Staff Changes

The authorized staff level of the Nuclear Data Section (NDS) consists of a total of 16 professionals and support staff. The latest staff changes include:

- Christian Hill (Head of Atomic Data and Molecular Data Unit) rotated out in September 2024.
- Alejandra Martinez (Software Engineer) joined in July 2024.
- Marco Verpelli (Nuclear Data Analyst/Programmer) retired in April 2025.

2. EXFOR Compilations

2.1 EXFOR Transmission

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

- 5 neutron tapes (3213-3217) for 48 new entries and 25 revised entries;
- 7 CPND tapes (B036-B037, D143-D147) for 39 new entries and 37 revised entries;
- 3 PhND tapes (G053-G055) for 11 new entries and 6 revised entries.

These include contributions from five centres (ATOMKI, CNDC, KNDC, NDPCI, UkrNDC) as well as two individual regular compilers (Myagmarjav Odsuren, Timur Zholdybayev).

Myagmarjav Odsuren (National Univ. of Mongolia, Ulaanbaatar) is compiling heavy-ion induced reaction data measured in the area 2 countries (e.*g.*, Germany, Italy) for area D.

Timur Zholdybayev (Institute of Nuclear Physics, Almaty) is compiling charged-particle induced reaction data measured by his group and some other groups in Kazakhstan for area D.

Two regular transmissions of the EXFOR/CINDA dictionaries (TRANS.9130–9131) were done in TRANS, DANIEL (backup) and archive format.

Number of new entries transmitted by final tapes (May 2024-May 2025)
(TZ: Timur Zholdybayev, MO: Myagmarjav Odsuren)

	NDS	ATOMKI	CNDC	KNDC	NDPCI	UkrNDC	TZ	MO	Sum
Neutron	0	-	33	1	10	4	-	-	**48**
CPND	0	1	*	1	8	7	1	21	**39**
PhND	0	-	-	0	1	10	-	-	**11**
Sum	**0**	**1**	**33**	**2**	**19**	**21**	**1**	**21**	**98**

* Area S entries are transmitted by CNDC and therefore not included in these statistics.

2.2 EXFOR Quality Control

During the reporting period, **78 preliminary tapes** (PRELIM) were uploaded to the NDS open area for checking by NDS and other centres. Two of them (PRELIM.**O099** uploaded on 9 Dec. 2024 and PRELIM.**O100** uploaded on 6 Feb. 2025) have not been reviewed by NDS yet since their releases have not been announced yet by NEA DB.

ZCHEX, JANIS TRANS Checker and ForEXy SPELLS are regularly used for review at NDS. The finalized tapes are also checked against the comments from centres before uploading to the NDS open area.

NDS also registers comments on EXFOR entries from users and centres to the **EXFOR Feedback List** (https://nds.iaea.org/nrdc/error/) and monitors the correction process by checking each preliminary tape against the feedback list.

The code strings of the primary references coded under REFERENCE are being reviewed for better connection between EXFOR entries and article pdf files in the NDS internal archival.

2.3 EXFOR Coverage Control

Under the EXFOR compilation control system, 19 **journal titles** are regularly scanned by NDS and registered to the EXFOR Compilation Control System (X4CoCoS), and they are listed in the **Article Allocation List** (https:/nds.iaea.org/nrdc/alloc/). Additional 17 journal titles were scanned until until December 2023 but not scanned yet since January 2024. Scanning of conference proceedings (e.g., EPJ/C) has been also delayed.

Additional 20 journal titles (including 2 titles scanned by both CNPD and NDS) are assigned for scanning by other centres, and NDS registered the scanning records from these centres in X4CoCoS. The IAEA library ceased subscription to **Physical Review Letters** (PRL) at the end of 2024. NNDC agreed with taking over the scanning role since 2025.

See **Regularly Scanned Journals** (https://nds.iaea.org/nrdc/alloc/exfor_scn.html) for the list of the journals and their volumes/issues scanned by the network last time.

2.4 EXFOR Master File

The EXFOR Entry File (https://nds.iaea.org/nrdc/exfor-master/entry/) is updated by ForEXy DIRUPD when release of a final Trans tape is announced by its originating centre. Based on the EXFOR Entry File at the end of 2024, a new EXFOR Master File (EXFOR-2024) was assembled by ForEXy MAKLIB and released (https://nds.iaea.org/nrdc/exfor-master/).

3. Services

The EXFOR-ENDF-CINDA-IBANDL web applications are now being maintained under version control in the internal Git server.

3.1 EXFOR Database

The EXFOR database (https://nds.iaea.org/exfor/) is updated when a final Trans tape is uploaded to the NDS open area. The history of the database update is summarized on "EXFOR: PRELIM and TRANS files, history of database updates" (https://nds.iaea.org/exfor-master/x4compil/exfor_updates.htm).

3.2 ENDF Database

The ENDF database (https://nds.iaea.org/endf/) was updated twice for addition of new libraries TENDL-2023 (June 2024) and ENDF/B-VIII.1 (October 2024).

The LARA files were generated from the ENSDF files twice in October 2024 and April 2025 and included in the database system for comparison MF8 MT457 of ENDF libraries.

New developments have been initiated to improve the workflow for processing ENDF libraries, as well as the storage and retrieval of datasets and nuclear observables.

3.3 CINDA Database

The CINDA database (https://nds.iaea.org/cinda/) has not been updated since October 2023.

3.4 IBANDL Database

The IBANDL database (https://nds.iaea.org/ibandl/) was updated in September 2024.

3.5 EXFOR-NSR PDF Database

The PDF database (for internal use only) has been updated 27 times, with the addition of 1,110 files. 592 from NSR and 518 from EXFOR. A new web tool has been developed and released to ease the upload of EXFOR PDFs by NDS members.

3.6 Document Services

Nuclear Data Section continues publishing the IAEA-NDS and INDC reports through our webpage https://nds.iaea.org/.

Number of reports published between May 2024 and May 2025.

Report code	Country of origin	Reports
IAEA-NDS	Nuclear Data Section	6
INDC(BLR)	Belarus	2
INDC(EUR)	European Commission	1
INDC(JPN)	Japan	1
INDC(NDS)	Nuclear Data Section	17

In 2024 NDS has started the project of assigning dois to all IAEA-NDS and INDC(NDS) reports retroactively. More than half of the reports can now be referenced with the doi. For the country reports (INDC-) it has been decided that only newly published ones will receive the doi.

3.7 Nuclear Data Newsletters

The Nuclear Data Newsletter is published twice a year (February and August) to inform the scientific community about actual NDS work, meetings held, projects, computer codes developed and new data libraries. During the reporting period, we published two issues of the Newsletter 77 and 78. We currently have 82 recipients of hardcopies and 1176 recipients of electronic version.

4. Visits and Inter-centre Cooperation

- B. Pritychenko (NNDC) visited NDS from 16 to 20 September 2024 to discuss finalization of EXFOR entries compiling data measured in USA.
- N. Otsuka (NDS) visited CNDC from 11 to 16 October 2024 to discuss finalization of EXFOR entries compiling data measured in China.

5. Training Activities (Schools, Workshops)

- Joint ICTP-IAEA Workshop on "Monte Carlo Radiation Transport and Associated Data Needs for Medical Applications", 28 October-8 November 2024, Trieste, Italy.

6. Nuclear Data Journal Publications (2024-2025)

Erratum to: Isomer production studied with simultaneous decay curve analysis for alpha-particle induced reactions on natural platinum up to 29 MeV
N. Otuka, S.Takacs, M.Aikawa, S. Ebata, H. Haba, *Eur. Phys. J. A* **61** (2025) 8.

Evaluation of uranium-233 neutron capture cross section in keV region
N. Otuka, K. Tada, O. Cabellos, O. Iwamoto, *Ann. Nucl. Energy* **212** (2025) 110977.

Activation cross sections of ^{7}Li-induced reactions on ^{nat}Ti: Implications for monitor reactions
M. Aikawa, S. Goto, D. Gantumur, D. Ichinkhorloo, N. Ukon, N. Otuka, S. Takacs, H. Haba, *Nucl. Instrum. Meth. B* **559** (2025) 165579.

Extension of recommended cross section database for production of therapeutic isotopes
F. Tarkanyi, A. Hermanne, A. V. Ignatyuk, F. Ditroi, S. Takacs, R. Capote Noy, *J. Radioanal. Nucl. Chem.* **333** (2024) pp. 717-804.

Extension of evaluated cross section database for charged particle monitor reactions
F. Tarkanyi, A. Hermanne, A. V. Ignatyuk, F. Ditroi, S. Takacs, R. Capote-Noy, *J. Radioanal. Nucl. Chem.* **333** (2024) pp. 4243-4331.

Examination of static fission properties of ^{236}U and^{233}Th using Cassinian oval parametrization within the macroscopic-microscopic approach
P. Jachimowicz, R. Capote and M. Kowal, *Eur. Phys. J. A* **60** (2024) 160.

Benchmarking of Stainless Steel Cube Neutron Leakage in Research Center Rez
Michal Kostal,..., Roberto Capote, et al., *Nucl. Sci. Eng.* **198** (2024) pp. 399-410.

Broomstick experiment with copper in VR-1 reactor
Michal Kostal,..., Roberto Capote, et al., *Ann. Nucl. Energy* **211** (2024) 110993.

High-energy neutron emission in thermal neutron-induced fission of ^{235}U
Martin Schulc,...,Roberto Capote, et al., *Phys. Rev. C* **109** (2024) 054616.

Measurement of spectrum averaged cross sections in LR-0 benchmark reference neutron field
Michal Kostal,..., Roberto Capote, et al., *Ann. Nucl. Energy* **206** (2024) 110616.

Looking for integral references for the fission cross sections in actinides above 1 MeV
Ignacio Duran, Roberto Capote and Georg Schnabel, *EPJ Web of Conferences* **294** (2024) 04001.

Monte Carlo evaluation of the semiclassical multi-step direct reaction series
Brett V. Carlson, Emanuel V. Chimanski and Roberto Capote, *EPJ Web of Conferences* **292** (2024) 04004.

Microscopic modeling of direct pre-equilibrium emission: impact on exclusive and inclusive (n,xn) and fission channels
M. Dupuis, R. Capote, et al., *EPJ Web of Conferences* **292** (2024) 04003.

Activation cross-sections of proton-induced nuclear reactions on natural zinc in the energy range of 4-30 MeV
M.U. Khandaker, H. Haba, A. R. Usman, M. Mahmoud, N. Otuka, S.K.I. Ali, *Radiat. Phys. Chem.* **226** (2025) 112272.

Isomer production studied with simultaneous decay curve analysis for alpha-particle induced reactions on natural platinum up to 29 MeV
N. Otuka, S. Takács, M. Aikawa, S. Ebata, H. Haba, *Eur. Phys. J. A* **60** (2024) 195.

Excitation functions of helion-induced nuclear reactions on natural copper up to 55 MeV
M.U. Khandaker, K. Nagatsu, K. Minegishi, M. -R. Zhang, M. Mahmoud, S. K. I. Ali, N. Otuka, *Radiat. Phys. Chem.* **224** (2024) 111999.

Activation cross sections of ^{7}Li-induced reactions on ^{nat}Cu for monitor reactions
M. Aikawa, S. Goto, D. Gantumur, D. Ichinkhorloo, N. Ukon, N. Otuka, S. Takacs, H. Haba, *Nucl. Instrum. Meth. B* **554** (2024) 165441.

Characterization of a HPGe detector response for activation cross section measurements: regression method versus Monte Carlo method
V. Semkova, N. Otuka and A.J. Plompen, *J. Nucl. Sci. Technol.* **61** No. 2 (2024) pp. 151-160.

The IAEA electronic stopping power database: Modernization, review, and analysis of the existing experimental data
C.C. Montanari, P. Dimitriou, L. Marian, A.M.P Mendez, J.P. Peralta, F. Bivort-Haiek, *Nucl. Instrum. Methods Phys. Res. B* **551** (2024) 165336.

Normalization of ToF (n,f) Measurements in Fissile Targets: Microscopic cross-section integrals
I. Duran, R. Capote and P. Cabanelas, *Nucl. Data Sheets* **193** (2024) pp. 95-104.

Benchmarking of Stainless Steel Cube Neutron Leakage in Research Center Rez
Michal Kostal, Zdenek Matej, Martin Schulc, Evzen Losa, Jan Simon, Evzen Novak, Frantisek Cvachovec, Vaclav Prenosil, Filip Mravec, Tomas Czakoj, Vojtech Rypar, Andrej Trkov, Roberto Capote, *Nucl. Sci. Eng.* **198** (2024) pp. 399-410.

FENDL: A library for fusion research and applications
G.Schnabel, D.L. Aldama, T. Bohm, U. Fischer, S. Kunieda, A. Trkov, C. Konno, R. Capote, A.J. Koning, S. Breidokaite, T. Eade, M. Fabbri, D. Flammini, L. Isolan, I. Kodeli, M. Kostal, S. Kwon, D. Laghi, D. Leichtle, S. Nakayama, M. Ohta, L.W. Packer, Y. Qiu, S. Sato, M. Sawan, M. Schulc, G. Stankunas, M. Sumini, A. Valentine, R. Villari, A. Zohar, *Nucl. Data Sheets* **193** (2024) pp.1-78.

EXFOR-based simultaneous evaluation for fast neutron-induced fission cross section of thorium-232
V. Devi, N. Otuka, S. Ganesan, *J. Nucl. Sci. Technol.* **61** (2024) pp. 44-56.

EXFOR-based simultaneous evaluation for neutron-induced fission cross section of plutonium-242
R. Okuyama, N. Otuka, G. Chiba, O. Iwamoto, *J. Nucl. Sci. Technol.* **61** (2024) pp. 57-67.