EXFOR compilations for CIELO project

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a passion for discovery



CIELO

- CIELO (Collaborative International Evaluated Library Organization).
- Six ENDF materials: ¹H,¹⁶O,⁵⁶Fe,^{235,238}U, and ²³⁹Pu.
- M.B. Chadwick et *al.*, Nuclear Data Sheets **118** (2014) 1–25.
- Informal presentation, people are invited to participate.

22.50	ScienceDirect	Nuclear Data
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ELSEVIER	Nuclear Data Sheets 118 (2014) 1-25	www.elsevie.com/locale/n
	The CIELO Collaboration:	
	Neutron Reactions on ¹ H, ¹⁶ O, ⁶⁶ Fe, ^{235,238}	U, and ²³⁹ Pu
M.B. Chadwick, ¹ , Y. Danon, ⁹ C Z. Ge, ¹³ S. O. Iwamoto, ¹² M A.J. Komin R. McKnight, ²⁰ M V. Pronyaev, ⁴ D E.Sh. Soukhowitk	E. Dapout ² E. Beage ³ A. Bishkin ⁴ O. Booland ⁴ D. D. Seint Jon ⁴ , M. Dam ⁴ , U. Erisch ⁻¹ R. K. Krawel, M. Grims, ¹⁴ G.M. Hale, ¹ M. Hernang ⁶ A. Igatyht ¹ , M. Jonebl, ¹¹ B. Joreth, ¹² M. Jonebl, ¹² S. Mariel, ¹³ S. Kuisel, ¹⁴ A. Kut, ¹⁴ Y. Jonebl, ¹⁴ T. Karawat, ¹⁵ S. Kuisel, ¹⁵ A. Kat, ¹⁵ M. Karawat, ¹⁴ S. Majakhghub, ¹⁶ O. Sogamo, ¹⁵ G. Palminiti, ¹⁵ Rociman, ¹⁶ P. Romini, ¹⁶ D. Romines, ¹⁶ D. Rolminiti, ¹⁵ J. Korker, ¹⁶ P. A. Kikolova, ¹⁶ P. R. Tany, ¹¹ D. Romines, ¹⁶ P. Schilbacka, ¹⁶ P. J. Kathu, ¹¹ L. Thewe, ¹⁶ J. J. G. Subley, ²⁸ P. Ladu, ¹ I. Thommesn, ¹⁶ A. Kikolova, ¹⁶ P. J. Kathu, ¹¹ L. M. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. K. J. Kathu, ¹⁶ P. J. Kathu, ¹⁶ J. Kathu, ¹⁶ P. Kathu, ¹⁶ J. J. Kathu, ¹⁶ P. Kathu, ¹⁶ Ka	Brown, ⁶ R. Capote, ⁷ A. Carlson, ⁸ ⁷ S.C. Frankle, ¹ T. Fukahori, ²² 1. Ishikwa, ¹² W. Iwaneto, ¹² ahler, ¹ B. Kielrowski, ¹ I. Kochli, ¹⁵ . MacIanes, ¹ D. McNabb, ²⁶ ²² A. Plempen, ²⁸ B. Pritychenke, ⁶ ex, ²³ M. Salvatorss, ⁵ S. Simakov, ⁷ R. Vost, ¹⁶ and S. van der March ⁴⁶
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CIELO/X4 Cooperation

- X4 was created to support ENDF evaluations.
- Unfortunately, our interaction is rather small.
- We have to find the way to make X4 more useful for CIELO project, and actively collaborate with ENDF.
- NRDC action: A53, According to the list of Entries with NODATA one of the following corrections
- UNOBT data is a big problem in the Area #1:
 - Four areas neutrons: 453 reactions, 621 datasets
 - Four areas all: 898 reactions, 1282 datasets
 - Area #1 neutrons: 167 reactions, 187 datasets
 - Area #1 all: 359 reactions, 398 datasets
- Clearly EXFOR is not complete even for neutron-induced reactions.
- Any other suggestions ???



UNOBT Data

Data that authors never sent to NNDC.

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Dnuu

NATIONAL LABORATORY

UNOBT Data for CIELO

- UNOBT (n & p?).
- Naohiko's error list for six materials should be fixed.
- ⁵⁶Fe is 91.754% => Fe-0 data are good, M.Herman.
- Missing articles??? Contact evaluators???
- CSEWG interactions.
- May be a new subgroup for X4 deficiencies that could be driven by nuclear physics needs.
- NNDC compiled all UNOBT data articles for six materials and neutron-, proton-induced reactions.
- NNDC compilations of elemental evaluations will start next.



Practical Exercise

- Access EXFOR data, and find UNOBT data for your area.
- Pick one entry and try to work on it.



List of Issues to Discuss

- EXFOR Editor, it should be platform independent, and controlled by the IAEA.
- Bug list: "Change to new format, lower case...." This is not a bug fix. We should look for serious bugs.
- X4 Email list: We have to clean it and remove "Dead Souls" from the list.
- Electronic library is supported by everyone at NNDC: NSR +X4 publications; IAEA is on the same page.
- Data transfer from X4 to NSR.



EXFOR

- Compilation of experimental nuclear reaction data
 - Mainly neutrons
 - Also charged particles and photons
 - 20,417 experiments (as of 6/25/2014)
 - Updated monthly
- Peer-reviewed compilations.
- Supports for and research activities in nuclear energy, astrophysics and medical applications.
- BNL compiles experiments from US and Canada: B. Pritychenko, S. Hlavac (Bratislava), O. Schwerer (Vienna).
- International project: NNDC, NEA, IAEA, Obninsk, ... coordinated by the Nuclear Reaction Data Centres (NRDC) network under auspices of the IAEA.







Example of Nuclear Data Recovery (Nuclear Archeology)



- Unpublished thesis by J.L. Kammerdiener (1972): "The data are probably available on a PDP-8 punched paper tape at LLNL..."
- 2013 EXFOR compilation,
 >160 manually-digitized plots for #14329 entry.
- MCNP6 simulations by S.
 Mashnik (LANL) to test compilation for ^{235,238}U and ²³⁹Pu.
- Public access to research results, direct data from authors are necessary.

