EXFOR compilations for CIELO project

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CIELO

- CIELO (Collaborative International Evaluated Library Organization).

- Six ENDF materials: ^{1}H, ^{16}O, ^{56}Fe, ^{235,238}U, and ^{239}Pu.

- M.B. Chadwick et *al.*, Nuclear Data Sheets **118** (2014) 1–25.

- Informal presentation, people are invited to participate.

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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.

UNOBT Data for CIELO

- UNOBT (n & p?).
- Naohiko's error list for six materials should be fixed.
- ^{56}Fe 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 **ENDF** B-VII.1 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.
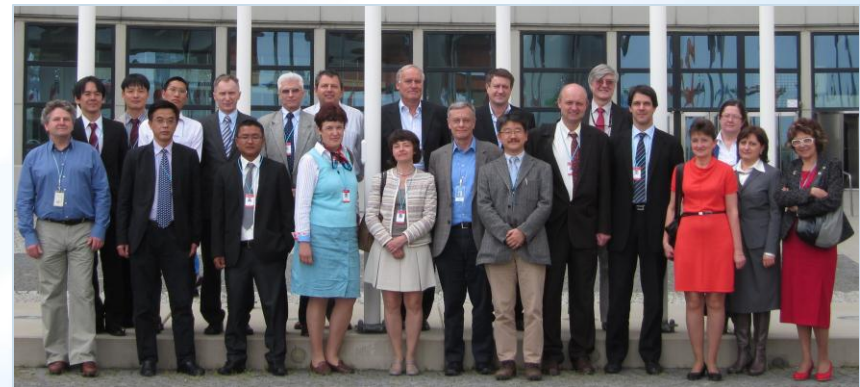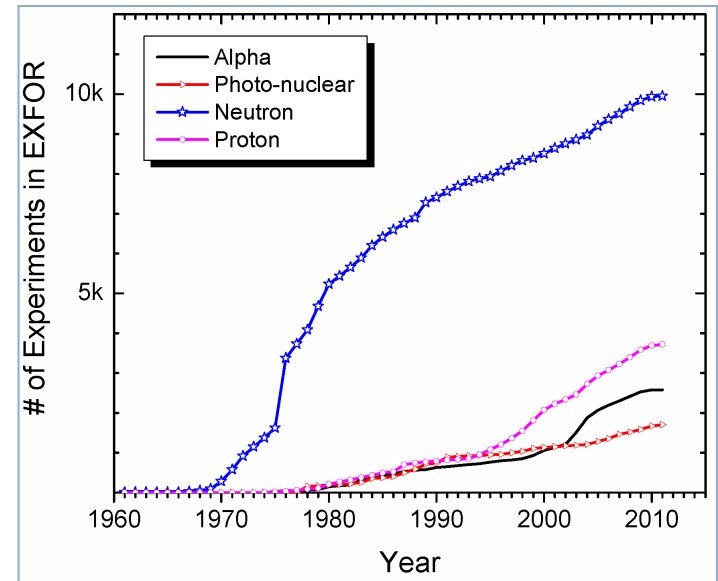
Example of Nuclear Data Recovery (Nuclear Archeology)

14 MeV n + ^{235}U → n (60 deg) + ...

Exp. data
MCNP6, ENDF/B.VII.1
MCNP6, ENDF/B.VII.0
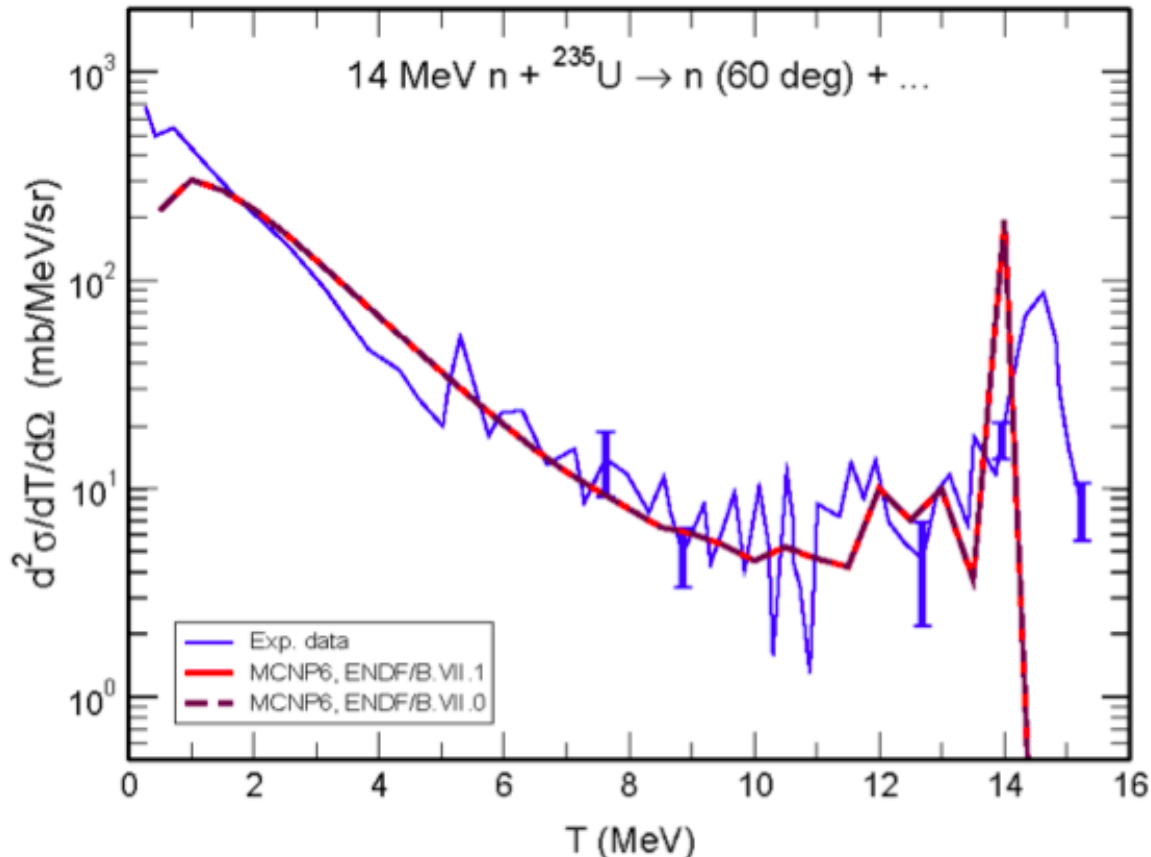
- Unpublished thesis by J.L. Kammerdiener (1972): "The data are probably available on a PDP-8 punched paper tape at LLNL…"

- 2013 EXFOR compilation, >160 manually-digitized plots for #14329 entry.

- MCNP6 simulations by S. Mashnik (LANL) to test compilation for ^{235,238}U and ^{239}Pu.

- Public access to research results, direct data from authors are necessary.