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Nuclear Data Activities at the IAEA-NDS

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Nuclear Data Section

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Outline

- **NRDC**
- **NSDD**
- **EXFOR**
- **CRPs**
- **Training**
- **Isotope Browser App**
- **News**

NRDC

- **International Network of Nuclear Reaction Data Centres (NRDC)**
- **Aim:**
  - **EXFOR**
- **Core data centres:**
  - **NNDC**
  - **NEA-DB**
  - **IAEA-NDS**
  - **CJD**
- **9 specialized centres**
- **Meeting Vienna, 21-23 April 2015 (without Centre Heads)**

NSDD

- **International Network of Nuclear Structure and Decay Data Evaluators (NSDD)**
- **Aim:**
  - ▶ **Provide up-to-date evaluated nuclear structure and decay data**
- **Regular meetings since 1974**
- **Last 20-24 April 2015 in Vienna see http://www-nds.iaea.org/nsdd/**
- **18 evaluation centres**
- **ENSDF master database at NNDC**

EXFOR

- **Database of compiled experimental data**
- **The EXFOR database was established in the 1960s**
- **Originally exclusively neutron-induced reaction data**
- **Now includes charged particle data and higher energies**
- **Since 2003 the EXFOR libraries at the various data centres have been merged**
- **NDS has responsibility for the maintenance of this Master file**

EXFOR (cont.)

- **EXFOR Compilation Control System used to coordinate the compilation of the data centres**

- **The average time between publication and compilation remains steady ~ 6 months**

- **EXFOR contains data for 20,841 experiments, 12,973,559 data points, web content is updated monthly**

- **Continuing effort to remove errors and inconsistencies from the database**

EXFOR (cont.)

- **To make best use of these data considerable work on various retrieval and visualisation systems**

- **Output formats:**
  - **EXFOR+ format**
  - **XML and HTML**
  - **C4 format - numeric data in simple tables**
  - **C5 format – C4 + uncertainty split (stat/syst)**
  - **Standard EXFOR format**

- **Development of EXFOR-XML and possible unification with ENDF in frame of SG 38**

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New features

- **Inverting reaction data using detailed balance.**
  Example: 13C(α,n)16O → 16O(n,α)13C
- **Text search in extended EXFOR (e.g.: " kerma", "PFNS", etc.)**
- **Database of expert's corrections to EXFOR data on Web (e.g. Fe-54(n,p); Mn-55(n,2n), (n,g); allows archival of needed known corrections to entries in EXFOR)**
- **Universal X4Plot with arbitrary selection and grouping columns**
- **New version (v2) of XML output format**

CRPs

- **Coordinated Research Projects (CRPs) - an IAEA tool to produce outputs by encouraging collaboration between various parties**

- **2 new CRPs started**
  - Improving the RIPL database, focussing on fission
  - Plasma wall interaction with low-activation steel surfaces in fusion devices (A+M)

- **Report on Prompt Fission CRP in final stages of preparation**

Beta-delayed neutron emission evaluation (2013-2017) P. Dimitriou

- **Beta-delayed neutrons are important for energy production, astrophysics and nuclear theory**

- **2nd RCM held 23-27 March 2015 in Vienna**

- **INDC(NDS)-0683, summary report in preparation**

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Validation of the International Dosimetry Library (IRDFF) (2013-2017) Simakov-Capote

- **A new version of dosimetry library for fission and fusion applications (IRDFF v1.05) released in October 2014**

- **2nd RCM held 16-20 March 2015 in Vienna**

- **INDC(NDS)-0682, summary report in preparation**

- **See https://www-nds.iaea.org/IRDFF/ for details**

Primary Radiation Damage Cross Sections (2013-2017) Simakov-Forrest

- **Bring together Nuclear Data and Materials Experts**

  - **to revisit NRT-dpa standard and to implement an upgraded one and improve gas production cross sections**

- **2nd RCM to be held 29 June - 2 July 2015**

- **See https://www-nds.iaea.org/CRPdpa/ for details**

Data Development Projects

- **Work on improving neutron cross section standards – 2nd TM was held 1-5 December 2014 with plan to release next version in 2016**
- **CIELO Project:**
  - **Improvements to the U-238 starter file**
  - **Evaluation of U-235 PFNS (related to the project on Nuclear Reaction Standards)**
  - **Evaluation of U-235 cross sections in the fast neutron energy range**
  - **Evaluation and validation of the Fe-56 cross sections above the resonance range**

Other points

- **Meetings of INDC and IFRC A+M subcommittee in 2016**
- **50th Anniversary of NDS (June 2014) was well received see https://www-nds.iaea.org//50years_NDS/**
- **Internal evaluation of NDS was completed**

Training

- **Provide outreach in the form of training, especially to developing countries**

- **Workshops held at ICTP Trieste (3 in 2015)**

  - ▶ **Modern Methods in Plasma Spectroscopy, A+M (*March*)**

  - ▶ **Nuclear Data for Neutron Dosimetry and Analytical Methods by Applying Research Reactors (*April*)**

  - ▶ **Nuclear Data Measurements for Science and Applications in collaboration with n_TOF/CERN (October)**

Isotope Browser App

- **Now available also on Apple platform**
- **Properties of over 4,000 isotopes**
- **> 15,000 downloads**
- *https://play.google.com/store/apps*
- *https://itines.apple.com*

News

- **IAEA-NDS intends to set up the Nuclear Data Evaluation Network (similar to NRDC)**
- **R. Forrest will retire from the IAEA**
- **A. Koning will succeed R. Forrest as the Section Head in summer**

Thank you!

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