Data Management in CoNDERC

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10.10.2022 - TM on CoNDERC
Compilation of Nuclear Data Experiments for Radiation Characterisation (CoNDERC)

The purpose of the CoNDERC project is to transfer into technology the experimental integral radiation information that can be used as part of the Validation and Verification processes of nuclear model and code systems, and to provide various schema to perform the V&V. Under the auspices of the IAEA Nuclear Data Section, individuals and institutions are assembling several of databases and code infrastructures based on their own V&V activities mainly associated with inventory, activation-transmutation, source term and radiation shielding R&D.

**Decay Heat**
- Fusion Events
- Fission Events

**V&V Protocol**
- Spectra
- Photonuclear
- Pencil Beam
- NG-24M RR
- Effective RR

**Shielding**
- Aspis
- CIAE
- FNS
- NIST
- Oktavian
- Pulsed
- Replica
- Tiara

**Beyond Keff**
- MCNP
- TRIPOLI
- OpenMC

**Experiments**
- Thermal Resonance
- Baghdad Atlas

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Current CoNDERC Website

- Written in Python (Django);
- Using Numpy and Plotly;
- Source code on GitHub (private for now);
Data Dissemination

- Currently: **19 datasets** (2 work in progress);
- Website built as a framework -> low effort to **add new datasets**;
Data Dissemination

The primary purpose of the International Criticality Safety Benchmark Evaluation Project (ICSBEP), the International Reactor Physics Experiment Evaluation Project (IRPhEP) and the Research Reactor Benchmarking Database: Facility Specification and Experimental Data Technical Reports Series No. 480 is to compile critical and subcritical benchmark experiment data into a standardised format that allows criticality safety analysts to robustly use the experimental data to validate simulation tools and cross-section libraries. However, in addition to criticality some benchmark evaluations also contain spectral indices and measured reaction rate data; another class of experimental data that can provide additional qualification of the underlying nuclear data and simulation tools. The aim of this work is to highlight the availability of such information and to illustrate to the technical community the need for a significantly greater number of active neutron histories when running Monte Carlo jobs to compare calculation and experiment.

Documentation

- R.E. Macfarlane et al. "A Code Comparison Study for the Bigten Critical Assembly" (resource)
- J.-Ch. Sublet "Critical Assemblies Benchmarking With the Monte Carlo Code TRIPOLI" (resource)
- P. Romano (2022) ICSBEP's beyond Keff
- D. Mancusi Python tool to convert MCNP geometries into TRIPOLI-4 geometries

Download all data [244.2 MB, 522 files]
or Access individual data sets

data.zip (data + doc)
Individual access
Individual Data Access (1) - Fusion
Individual Data Access (1)

Fusion

- Dynamic plots built based on the available data files;
- Direct download for each data file or plot;
- Download all files (.zip) for each element (dynamically built);
- Timestamped data;
## Individual Data Access (2) - Spectra

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### Individual Data Access (2) - Spectra

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**Show 10**

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**Data Files**

- arb_flux.txt
- figure.png

**ACCR-LB44**

- ACRCLdPoly
- ACRCLdPoly
- ACRFF-C-C-32C1
- ACRFF-C-C-32C1
- ACRCLB44
- ACRCLB44

**Energy (eV)**

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<td>10^3</td>
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</tbody>
</table>

**Previous** | **2** | **3** | **4** | **5** | **...** | **13** | **Next**
Individual Data Access (3)
GitHub

A 3rd possibility of accessing the data
Using GitHub - Prototype Oktavian
Using GitHub - Prototype Oktavian

• Advantages

  ‣ Version control;

  ‣ **History** of changes / releases;

  ‣ **Streamlining data publishing** (automatic hook to publish data on the CoNDERC website);

  ‣ Avoiding sending data via e-mails and version entanglement;

  ‣ *Optional* Could publish (processing) code along the data -> going towards *reproducible data/research*;
Using GitHub - one step further

• [Optional] Could publish Jupyter notebooks with examples of data processing
  ‣ Automatically rendered on GitHub;
  ‣ Use binder to run notebooks in the cloud;
  ‣ Use docker to package the notebook + dependencies.
What do users want?
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Thank you!

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