

FUDGE Software Abstract

1a. Software Acronym:

fudge

1b. Short Title:

fudge: For UpDating and Generating Evaluations

2. Developer Name(s) and Affiliation:

Bret Beck, David Brown, Caleb Mattoon, Neil Summers, Nidhi Patel (LLNL)

3. Software Completion Date:

11-2012

4. Brief Description:

Fudge provides (Python based) tools to:

- Store and modify nuclear data.
- Convert ENDF-6 formatted nuclear data [1] into the new GND structure-based format [2].
- Convert LLNL's ENDL formatted nuclear data [3] into the new GND structure-based format [2].
- Process nuclear data for use by Monte Carlo and/or deterministic codes. Fudge contains hooks for the future addition of nuclear data processing routines (resonance reconstruction routines are already included).

The Fudge release includes samples of published ENDF-6 formatted data that can be converted to the new GND format.

This software is the next release in a series of releases that began with GND version 0.1 [2]. We have renamed the translation codes so that it is easier to distinguish between the data format (GND) and the data code infrastructure (fudge).

5. Method of Solution:

Reads ENDF-6 file or an ENDL file, and parses it into python classes, then writes the data out into the new structure in the XML language. Also contains a routine to convert the XML file into an HDF5 file.

6. Computer(s) for which software is written:

Unix, Mac, PC.

7. Operating System:

Unix, MacOSX, and Windows.

8. Programming Language(s) Used:

Python, C/C++, FORTRAN77 and HDF5.

9. Software Limitations:

N/A

10. Unique Features of the Software:

Converts popularly available nuclear databases into a common, modern structure.

11. Related and Auxiliary Software:

FETE [4-5], PREPRO [6] and HDF5 [7].

12. Other Programming or Operating Information or Restrictions:

To convert an XML file into HDF5 requires the external software package HDF5 [6].

13. Hardware Requirements:

No significant CPU or memory requirements.

14. Time Requirements:

No significant time required for reading individual physics reactions.

15. References:

1. <http://www.nndc.bnl.gov/nndcscr/documents/endl/endl201>
2. B. Beck, C. Mattoon, D. Brown, "Beta release of the new GND structure for storing nuclear reaction data," LLNL Report number LLNL-SM-461374.
3. B. Beck, G.W. Hedstrom, T.S. Hill, A.A. Marchetti, D.P. McNabb, "ASCII format specifications for the Evaluated Nuclear Data Libraries (ENDL)", LLNL Report number UCRL-TM-218475
4. Brown, D., and Hedstrom, G., "User's Guide to fete - From Endf/B-VI To ENDL", LLNL Report number UCRL-SM-218496 (2006).
5. "Translated ENDF formatted data at LLNL," LLNL Report number UCRL-MI-223442, UCRL-TR-222551.
6. <http://www.nds.iaea.org/ndspub/endl/prepro/>
7. <http://www.hdfgroup.org/HDF5>