

Beyond the ENDF format: Summary discussion and writing assignments

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We have attempted to organize the day to cover all aspects of how a new format could improve our community

- (0) Welcome & recent history with formats (Mattoon)
 - How we got here and why we want to do this.
- (1) Purpose of the new data structure (D. Brown)
 - Scope, high-level goals and philosophies, what should we NOT do?
- (2) Nuclear Data Systems Overview (W. Haeck)
 - How can we improve the interactions between experiment/theory, evaluation, application codes, and regulators? Enhance workflow?
- (3) Benefits and requirements for evaluation & processing (Y. Peneliau, M. Coste-Delclaux, I. Kodeli)
 - What features do we want to improve data evaluation and data processing?
- (4) Format and Organization perspective (B. Beck)
 - What features do we want to make maintaining, storing, access, sharing easier?
- (5) Requirements for basic data structures (V. Zerkin & R. Mills)
 - What types of data do we want to be able to store and retrieve?

There is obviously a lot of overlap between these areas.
Goal is to capture the needs and desires of all stakeholders.

New Features / Requirements for new format

- Governed by an international organization which will maintain the documentation of the format (0)
 - Initially backwards-compatible with ENDF-formatted data
- Hierarchy should reflect our understanding of nuclear reactions/decay and utilize nesting to clearly and uniquely specify data (1)
 - My proposal would be something like this, but I'm open to other ideas
 - Reaction
 - Energy range
 - Channels
 - Outgoing distributions
- Open-source APIs for reading and writing should be defined for the format and initially provided in Java and C with C++ and FORTRAN wrappers (2)
- Open source infrastructure to manipulate, search, plot, process, translate and assure the quality of the data (2)
 - At least two independent tool sets
- Support multiple representations of the same reaction data simultaneously (e.g. evaluated and processed) (3)
 - Encourage evaluators to provide a pointwise representation for easier plotting and consistency checking
 - Support both inclusive and exclusive reaction data – open question is whether to require consistency
- Accommodate extensible data containers not formally recognized by governing organization (3)

New Features / Requirements for new format

- Require evaluators and data processors to provide detailed information needed to reproduce and extend their data (3)
 - History, versioning, and bibliographic references could be required elements
 - EXFOR data used should be provided
 - Documentation or links to codes used and code parameter input files (eg RIPL data)
 - Allows for evaluation comments interspersed throughout
 - Transmission coefficients?
- Provide enhanced capabilities and simplicity for storing interfering resonances and covariances (3)
 - Covariance support for both model parameters and data matrices (but not file 36 capability)
- Eliminate redundancy where possible (e.g. masses, Q-values) and explore the possibility of linking to an external particle database (eg RIPL) (4)
- Support any particle and any combination of reaction products in a self-consistent way (4)
 - Products should be allowed to have decay products
- Require the user to specify the precision, physical units, and interpolation of the data (5)
 - From a documented/approved set
- Should include low-level data structures that will be shared between data products (eg EXFOR, RIPL, ENSDF, data) (5)

Questions

- Is it realistic to define a default distribution if one isn't provided?
 - GND currently requires evaluator to specify which particles are “transportable” and checks that energy-angle distributions are provided for transportable particles