

WPEC Sub-group proposal on *Use of Shielding Integral Benchmark Archive and Database for Nuclear Data Validation*

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Justification

- More complete picture needed for general purpose ND validation: extending ND validation to shielding benchmarks provides a complementary and a more complete view on the challenges linked to the radiation propagation calculations and allow to judge on a wider-scope performance of the evaluated nuclear data.
- Feedback from the nuclear data community on their expectations and experience in using SINBAD would help to further develop and focus the future work in the database containing now over 100 benchmarks.

Main challenges, objectives and proposed activities

- (1) To provide feedback on the existing database and contribute in this way to the quality review as started about 10 years ago at the NEA. The feedback would consist of developing and contributing input models for different transport codes, judging the completeness and consistency of the available benchmark information, identifying the missing or inconsistent data, in particular concerning the evaluation of the experimental sources of uncertainty.
- (2) Conclusion which benchmarks are adequate for ND validation.
- (3) Provide recommendations to WPRS on the SINBAD evaluations based on the experience, needs and expectations of the nuclear data community;
- (4) To participate in establishing the priority list of relevant benchmarks according to the needs of the nuclear data community, in particular among new and more recent benchmarks; promote including the selected benchmarks in SINBAD; contribute the available sensitivity profiles to be included in the database.
- (5) To participate, in coordination with the EGRTS WPRS, in establishing the review group and organisation of pilot review of SINBAD evaluations.
- (6) Of particular interest is the feedback on the completeness and consistency of uncertainties and correlations.

Relevance to other NEA ND activities

Subgroup would work in tight coordination with other NEA activities such as EGRTS, WPEC SG45, SG46, CIELO and JEFF project, where this work could be used to guide the evaluations. Feedback from these groups on the specific needs and the use of SINBAD data is expected.

SINBAD evaluation work could be coordinated with the interest of SG46 on “Efficient and Effective Use of Integral Experiments for Nuclear Data Validation”.

Past experience in integral benchmark evaluations from the ICSBEP, IRPhE and SINBAD projects will be valuable.

Time Schedule and Deliverables

- Year 1:

- In coordination with other SGs and EGRTS identify potential SINBAD benchmarks to serve as pilot exercises for ND evaluation
- Identify other potential benchmarks not yet in SINBAD, establish a priority list of relevant benchmarks for future evaluations
- Organise review group participants to perform benchmark analysis using available data;

- Year 2:

- Benchmark analysis of the subset of shielding benchmarks, collection of results
- Contribute the available sensitivity profiles to be included in the database
- Distribute and discuss the review of the selected shielding benchmarks serving as a prototype for future work
- Select benchmarks from the priority list to promote the evaluation in the SINBAD database

- Year 3:

- Coordinate with EGRTS new benchmark evaluations and benchmark reviews, for the integration in SINBAD and release of the evaluation to be used by other SGs.
- Draw conclusions on the evaluation process and provide recommendation of good practices useful for future ND validations using Shielding and Transmission Benchmarks. Of particular interest is the feedback on the completeness and consistency of uncertainties and correlations, including those in neutron sources, engineering and others.