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Advanced Nuclear Technology Group NEN-2

Subject: Trip Report for Nuclear Data 2019

During May 2019, Nicholas Thompson and Wim Haeck traveled to Beijing, People's Republic of China for the 2019 International Conference on Nuclear Data for Science and Technology (Nuclear Data 2019, or ND2019).

ND 2019 Conference

Wim Haeck presented a talk titled "New R-Matrix Resonance Reconstruction in NJOY21" (LA-UR-19-24484). Nicholas Thompson presented an Invited Talk titled "National Criticality Experiments Research Center (NCERC) - Capabilities and Recent Measurements" (LA-UR-19-24570). He also served as the Session Chair for the "Integral Experiments 3" Session. These two presentations and the program for the meeting are attached. Hundreds of papers were presented from a very international mix of participants.

Presentations, Meetings, and Discussions

Many presentations used the TALYS code to perform total monte carlo simulations. These tools seem particularly useful in determining correlations and covariances. Cyril de Saint Jean presented on the CONRAD code, which helps to streamline the cross section evaluation and validation process.

At various points, Dave Brown (NNDC, BNL) discussed the CIELO ^{56}Fe evaluation. There are still issues with ^{56}Fe , particularly with inelastic scattering. Iron is a major structural component in many nuclear systems, and ^{56}Fe has a natural abundance of over 91.75%. He mentioned that because of the uncertainty in the ^{56}Fe cross sections, the minor isotopes of Fe become important, as do the other components of steel, such as chromium and manganese. There are some benchmarks sensitive to chromium and manganese cross sections, but the vast majority are sensitive in the thermal region – additional benchmarks sensitive to manganese and/or chromium would be useful to the nuclear community, and especially useful to cross section evaluators.

In side conversations, Massimo Salvatores (formerly CEA) talked about integral benchmarks and how they are most useful to him. He mentioned that integral benchmarks with filters around samples, changing the density of the sample, varying energy spectra, and benchmarks with a sample in the center and a flat fundamental mode are all useful. One point that he (and others) raised was that k-eff is in many cases not as important as the trends between similar

measurements – for example, if adding more of a sample creates a consistent decline in C/E when comparing to simulations, that trend is very important because evaluators and adjusters can see if specific changes to nuclear data help to fix these issues.

In side conversations, Catherine Percher (LLNL) talked about the TEX experiment series and other topics related to integral experiments and the needs of the nuclear criticality safety community. She said for the nuclear criticality safety community, it was important to have the right energy spectrum and sensitivities for that specific application. She also discussed deficiencies in and the lack of intermediate energy plutonium benchmarks.

The authors also attended the WPEC-Subgroup 45, Validation of Nuclear Data Libraries (VaNDaL) meeting. One of the main goals of this work is to develop benchmark models that are consistent between codes and can be easily run to validate nuclear data. Wim Haeck (LANL) presented his proposal for translating simulation results into a common file format (JSON format) which is easily readable/comparable.

Attachment(s): Haeck – New R-Matrix resonance reconstruction in NJOY21.pdf
Thompson – NCERC Capabilities and Recent Measurements.pdf
ND2019-Agenda+Abstract.pdf

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