Comments on WPEC Subgroup 30

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Role of EXFOR in Evaluations

Modern evaluations heavily rely on several quality databases:

- **Atlas of Neutron Resonances**

- **RIPL library of input model parameters**
  - Three IAEA CRPs since 1994, RIPL-3 release in the pipeline

- **Integral experiments**
  - International effort to review criticality safety benchmarks and produce recommended sets, ICSBEP, last edition 2007
  - Similar international effort initiated for reactor physics benchmarks

- **Microscopic experiments**
  - EXFOR library is important and unique, but it was never reviewed
  - WPEC SG 30 represents a type of effort needed to achieve this
Global Nuclear Data Initiative (GNDI)
Proposed by BNL-LANL at the AFCI Workshop, Washington DC, 2006

Microscopic experiments

Input parameter libraries

loop over 400 nuclides

EMPIRE/KALMAN

Covariances

Cross sections

ENDF library

Transport calculations

loop over 700 benchmarks

Global approach - thousands of microscopic and integral measurements used simultaneously to constrain model parameters

Physics - improved set of model parameters with covariances, global assessment of nuclear reaction theory

Nuclear Data – consistent, more accurate, and validated cross sections with covariances

High-Performance Computing: 100 teraflops needed to perform one iteration per day
Opportunity for EXFOR - Covariances

• EXFOR plays essential role in evaluation work
• Covariances may dominate the field for next 5-10 years
• This provides real opportunity to improve EXFOR
• What should be done?
  – Establish active communication with evaluators/users
  – Encourage reporting of problems and ensure fast response
  – Make use of actual analysis of experimental data needed for covariance evaluations
  – Gradually move to “quality” EXFOR