

# **WPEC Sub group 34**

**“Coordinated evaluation of  $^{239}\text{Pu}$   
in the resonance region”**

**Kick off meeting**

**2010, June 2, NEA Headquarters**

# History

- Sub-group proposition by McKnight/Dunn/Chadwick on June 2009 at previous WPEC meeting
- Justification :
  - General discrepancies on Pu-SOL-THERMAL assemblies and Pu-INTER assemblies
  - JEFF 3.1.1 thermal part
  - New Derrien/Leal ENDF resonance files :
    - With covariances
    - Using new microscopic data sets
- Goal → obtain and improved  $^{239}\text{Pu}$  resonance evaluation :
  - including covariances
  - consistent with our fundamental cross section data,
  - leading to improvements in calculations of integral data

# Proposition of Work

- Evaluation :
  - $^{239}\text{Pu}$  resonances range with covariances
  - $^{239}\text{Pu}$  unresolved resonances range with covariances
  - $^{239}\text{Pu}$  fission spectra (chi)
  - $^{239}\text{Pu}$  nubar in the thermal range as well as in the resonance range.

# Proposition of Work

- Benchmarking :
  - Define a set of public Benchmarks related to  $^{239}\text{Pu}$  nuclear data: ICSBEP and IRPhEP.
  - Calculations of these benchmarks with various evaluations (ENDF, JEFF, JENDL,..)
  - Use of sensitivity analysis (combine Microscopic and Integral experiments) to help improvement of nuclear data

# Proposition of Work

- Various task :
  - Insure proper link with SG32 (URR treatment)
  - “Background” information analysis :
    - We note that LANL has done simulations to test the impact of various prompt neutron spectra on criticality, and found a significant sensitivity of the results to the chi matrix adopted. The proposed WPEC subgroup should take advantage of ongoing work, coordinated by a new IAEA CRP, on the prompt fission spectrum
    - Fast region evaluations (JEFF, ENDF) and the corresponding partial cross sections splits : contributions from capture, inelastic, etc are quite different and differences between various evaluations for inelastic scattering, were pointed out.
  - Propose new microscopic measurements if needed

# Time Schedule & Deliverables

- June, 2010 Review of SG Proposal by WPEC; initiate Subgroup activities
- From June to September 2010, Define a list of participants and corresponding activities (evaluation, benchmark, various,..)
- December 2010, Report on Benchmarks with fine analysis of sensitivities to  $^{239}\text{Pu}$  nuclear data files
- June, 2011 Preliminary revised resonance evaluation for testing
- June, 2011 Report on  $^{239}\text{Pu}$  fission spectra breakthrough
- June, 2012 Present Final Report of Subgroup activities, including :
  - documentation and recommendation of a new resonance evaluation for  $^{239}\text{Pu}$
  - benchmark performance for Pu-fuelled thermal and intermediate energy systems with the recommended evaluation
  - motivation for new  $^{239}\text{Pu}$  measurements, if needed.

# Already targeted members

- Monitor : R.D. McKnight
- Coordinator : C. De Saint Jean
  
- ENDF : L.Leal, H. Derrien, S. Kahler , Talou + *to be defined*
- JEFF : G. Noguere, O. Bouland, D. Bernard, O. Serot, O. Litaize, *P. Schillebeeckx?*, + *to be defined*
- JENDL, *to be defined*
- BROND, *to be defined*
- CENDL, *to be defined*
- IAEA : Maslov ?, Capote ?