



CEA Contribution to WPEC/SG33

R. Jacqmin

- 1. Motivations**
- 2. Data and methods to be used by CEA**
- 3. Comments**

➤ Some CEA motivations

- Improved ND library for GEN-IV SFR prototype design studies
- Past experience in ND adjustment studies.
Lessons learned from past global adjustment studies (ERALIB1)
→ alternative approaches should be considered

➤ Issues of particular interest

- Methodologies**, not specific experiments or evaluated file
- Impact of ***a priori* covariance data** in multi-group data on conclusions, robustness of overall process
- Impact of covariances in integral measurements
- Improved (“optimized”) definition of future integral experiments
- Motivation for revised evaluations and new differential measurements, impact of cost function in minimization problem

➤ Data & methods

- ERANOS-2.1
- JEFF-3.1-based libraries, 33 groups and 1968 groups
- Subgroup method
- Perturbation theory modules (2-D S_n)

➤ Adjustment methodologies

- Reactor physicists' global approach, if number of experiments is reasonable
- Selective approach, involving ND evaluators and reactor physicists
- ...

➤ **About the 6 questions asked:**

1. Objective should be reasonable, scope should be limited, modelling and calculation steps should not be too complicated
2. Contributors: De Saint Jean, Jacqmin, Tommasi, Archier, Bernard
3. Use limited set of (simple) experiments, and limited set of isotope/reactions
4. OK on 33-group structure.

However, it would be interesting to test the method using a coarser grid, and compare the findings

5. Focus on a single, reference FR.

However, it would be useful, at some later stage, to check the “recommended method” on another FR, using the same type of constituents (fuel, structurals, coolant), but having different core characteristics (volume fractions, size, arrangement, BG...).

6. List of 11 isotopes and reactions is sufficient. Many adjustable parameters already!

➤ More comments

- ❑ Final sentence in Item 13 of 1st meeting Minutes is beyond the scope of SG33 :

Feedback would be provided to the different evaluation projects on which isotope, reaction, and energy range needs to be improved

- ❑ Agree on a reference set of covariance data + integral experiments + description of targeted system + list of target design quantities.

Coordinators should provide those data

- ❑ Effects of (i) differences in evaluated libraries, and (ii) differences in *a priori* covariances should be investigated separately.

Possibly also non-linearity limits

➤ More comments

- Would it be of interest to the SG participants to be also provided with a reference set of 33-group cross sections, in a simple tabulated format? Would serve to make sure they all get the same reference results.

- Consider numerical tests:
 - ✓ By providing a deliberately perturbed set of cross sections and associated covariances, and ask the participants to recover the perturbation
 - ✓ By providing “simulated” measurements/experiments and associated covariances could be considered

- Some resources should be saved for subsequent cross comparisons of results, analyses, etc. Table format of expected contributions should be specified in advance