

Workshop 6 – Benchmarks and Intercomparisons, Adjustment Methods

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Discussions were focused on the state-of-the-art of reactor dosimetry and the awaited needs in the field. They concentrated on nuclear data, calculation schemes, and experimental benchmarks (ZPR and reactors). The adjustment methods were not discussed. Those items are detailed hereafter.

Nuclear data (treated extensively in a parallel workshop)

Major concerns relative to nuclear data are the followings:

- Lack of cross section covariances for structural materials, as well as for the dosimeters.
- Lack of photon data (production but also γ -induced reactions).
- Insufficient knowledge of specific materials, such as *stainless steel* (i.e. iron, chromium, nickel) or *concrete* (mainly impact of gamma on lifetime).
- An extension to higher energy is required (Gen-IV or fusion).

Calculation Schemes

Numerous numerical benchmarks exist, but deterministic calculation schemes should rather be validated on existing or new experiments. The question rising is the lack of open experimental benchmarks, as many experiments have been or are being conducted in research reactors or ZPRs (critical facilities). This point is detailed in the next paragraph.

Experimental Benchmarks

Many items were identified in this field, most of them concern the sharing of experimental knowledge, or the development of programs in an international framework:

- Some programs have been made in both ZPRs and , some of them led to international benchmarks (VENUS-1, 2 and -3 from SCK Belgium), others are not open (FLUOLE – Gen-II vessel fluency – and PERLE –EPR reflector – programs for example in the EOLE facility in France) to the international community.

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- International programs can be studied and launched in shared facilities. However, few facilities, mainly in Europe (0 in USA) can propose sufficient flexibility to new experimental programs: those programs could be cost-shared within an international cooperation.
- As for nuclear data, an extension to Gen-IV benchmarking is highly expected (as it is the case for the on-going FREYA program in VENUS – Belgium -for ADS purposes).
- Development of new instrumentation for neutron/photon measurements.
- Dosimetry for burnt fuel transportation, and associated benchmarking was also mentioned.

A major concern covering all is the requirement for a complete dosimetry investigation is the **gamma heating field**. It was suggested that a *special focus* on that subject could be proposed *for the next ISRD conference*.