Discussion on how to select integral benchmarks in nuclear data adjustment

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Q1: which kind of adjustment is expected?

- ✓ **A: general purposed;**

  Adjustment is applied to improve the quality of evaluated nuclear data.

- ✓ **B: special purpose;**

  Adjusted library is only used to improve the prediction of a specific target reactor.

- ✓ **C: Not so general purposed, but can be used to improve evaluated files.**

  Adjustment is between case A and B.

We want to realize A, but more likely to achieve C.

Q2: what kinds of improvements are expected in adjustment?

- **Lower the calculation bias of integral quantities for one nuclear facility/benchmark.**
  - k_{eff}, reaction rate ratio, SVR, leakage spectra, et al.
- **Remove the trend of C/E values for several or dozens of benchmarks.**
- **Improve the chi2 of k_{eff} for thousands of criticality benchmarks.**
- **Improve the prediction of neutronics characteristics for a new nuclear facility.**
- **Lower uncertainties of predictions.**
- **…?**

Q3: what kind benchmarks should be included in adjustment?

- A benchmark with large calculation bias.
- Several or dozens of benchmarks with some kind of C/E bias.
- Benchmarks similar to a specific reactor.
- Integral quantities from benchmarks with good predictions.
- …?

- *Since we need benchmarks to validate the adjusted library , to include all or thousands of benchmarks in adjustment is not suggested.*

Q4: what we want to reserve in adjustment?

- Differential data evaluated based on high precision measurement.
- Integral quantities from benchmarks with good predictions.

Q5: How to reserve good prediction?

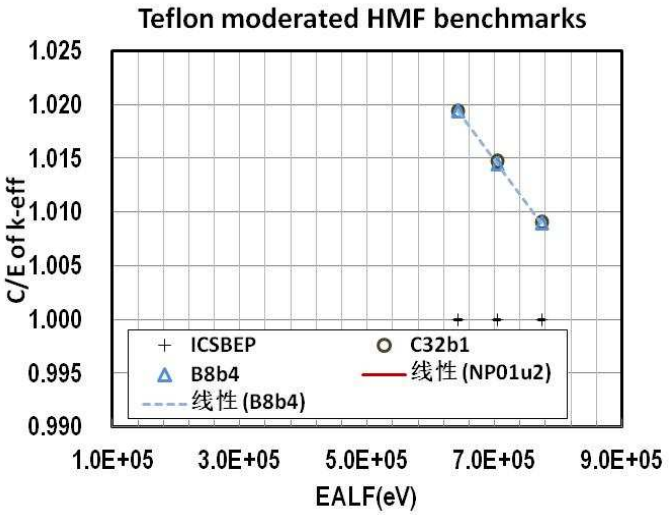
- Put benchmarks with good predictions into adjustment and serve as constrains?

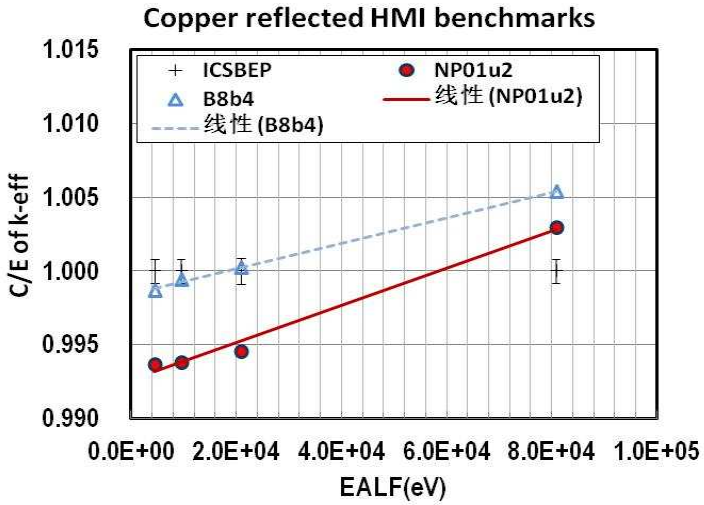
Q6: How to deal with compensation?

- Still open question, maybe do physics judgment before adjustment.

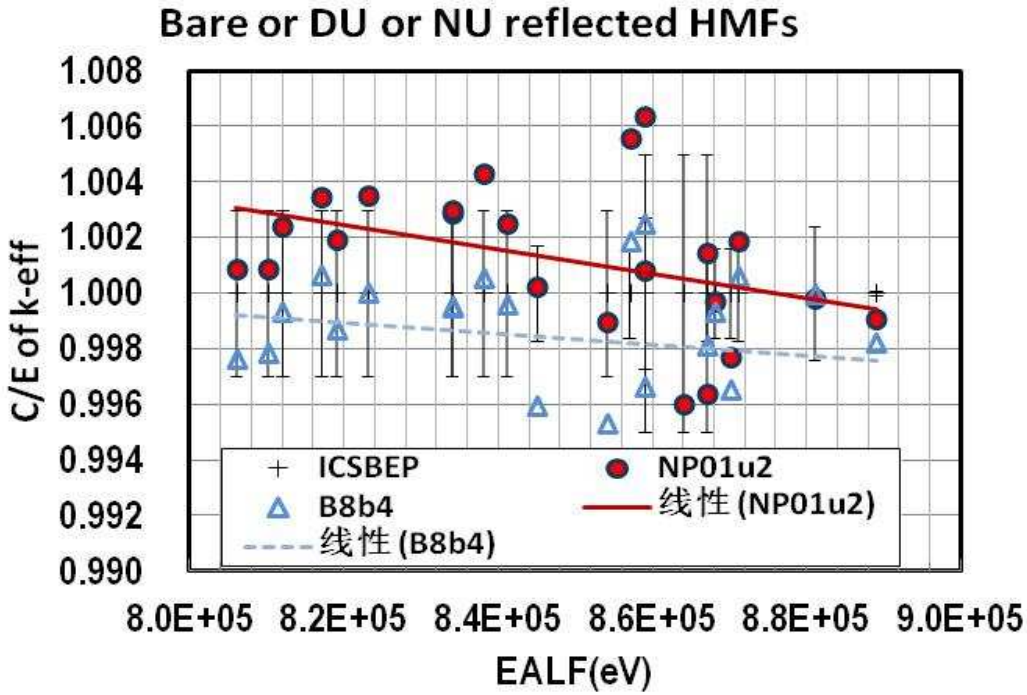
Suggestions

- **Design some exercises to verify above ideas.**
  - Execise A : improve a benchmarks with large calculation bias: PMI2,HCI5.5,et al.
  - Execise B: improve k_{eff} trends
    - CF2 bias in HMF7.32,33,34, Cu bias in HMI6.





– Execise C: reserve good predictions
  • HMF1, 2, 3, 7,14,28,32



Expected your opiniors!