

Notes on Calibration

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It is one of the chief merits of proofs that they instill a certain amount of skepticism as to the result proved

Bertrand Russell

Calibration in B-VII

- We have made small adjustments to improve prediction of critical assemblies:
 - nubar increases ...for fast assemblies
 - elastic angular distributions
 - nubar thermal for DN, and for 235U (old Madland)
- Physics motivated. Often consistent with differential data, but not always (e.g. prompt nubar > 2 sigma in some cases)
- Are we getting the right answer for the wrong reason?
 - yes, at some level
- Does it matter? Possibly, away from calibration point.

Calibration in B-VII

- Tremendous progress in B-VII by close collaboration between evaluators & data testers, during evaluation process
 - solved many reflection bias problems
 - fast criticality
 - helped solve 238 LEU reactivity; HEU thermal crit.
 - Zr elastic distributions BNL-KAPL
- But, we did this in a pretty crude way. Trial and error.
- We also probably got it wrong in some cases
 - Be elastic adjustment. There was some basis from expt data, but the change we made seems problematic.
- We could do this in a much more sophisticated way!

How to do this more accurately. (Speaking as a non-specialist observer here!)

- Build complete covariance databases based on fund. data
 - uncertainties on spectra and angular distributions & chi as well as on cross sections and nubar
 - we have found these to be v. important!
- Analyze 100s of critical assemblies
 - create sensitivity matrices
 - our possible mistake with Be was due to our studying too few assemblies
- Combine integral & fundamental information, eg KALMAN
 - create adjusted data - would be consistent with known fundamental and integral uncertainties
 - posterior uncertainties should be consistent with known info

More Bertrand Russell quotes!

The trouble with the world is that the stupid are cocksure and the intelligent are full of doubt

One of the symptoms of an approaching nervous breakdown is the belief that one's work is terribly important