$^{19}\mathrm{F}(\gamma,\alpha)^{15}\mathrm{N}$ Energy Width Systematic Studies

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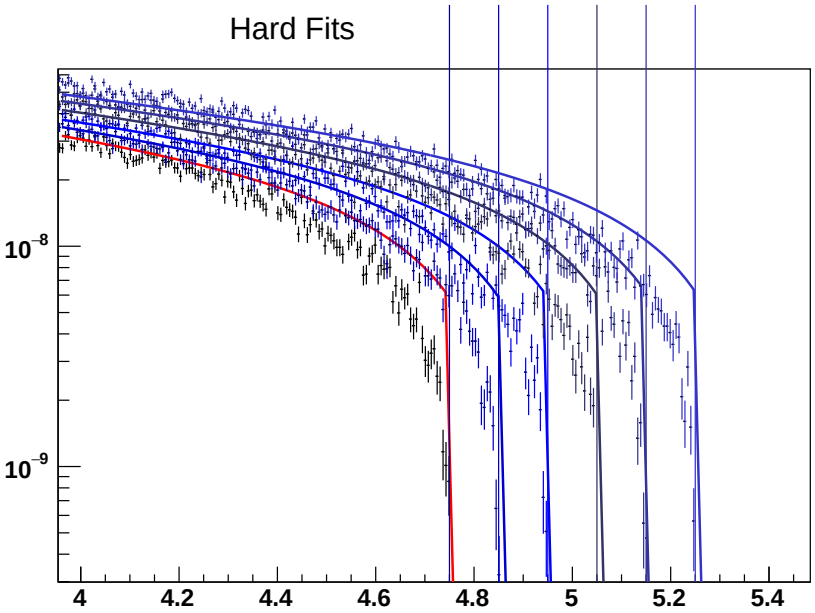
March 22, 2018

Summary

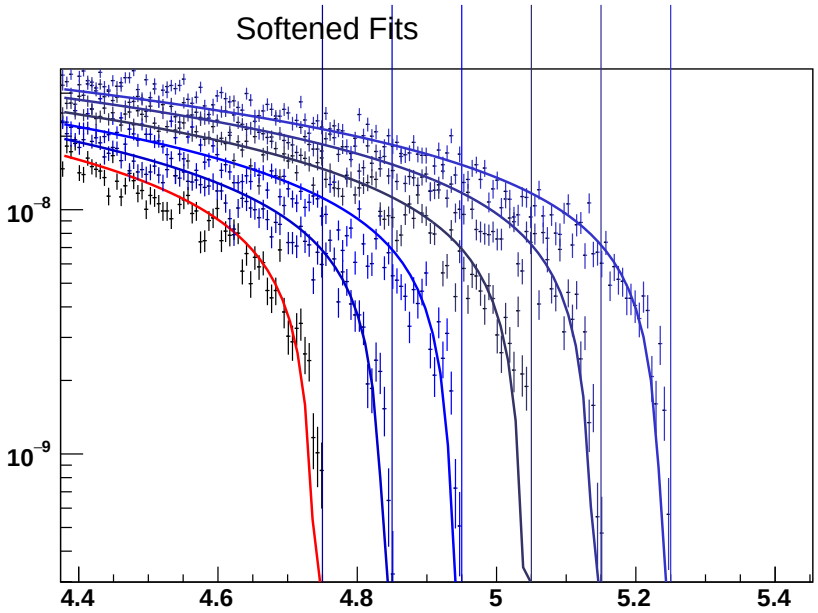
- Statistics from G4 now looking useable
- Position study results basically unchanged from last time
- Now looking at energy width

Observed Energy Width vs. Ideal

Regular Shiff Fit

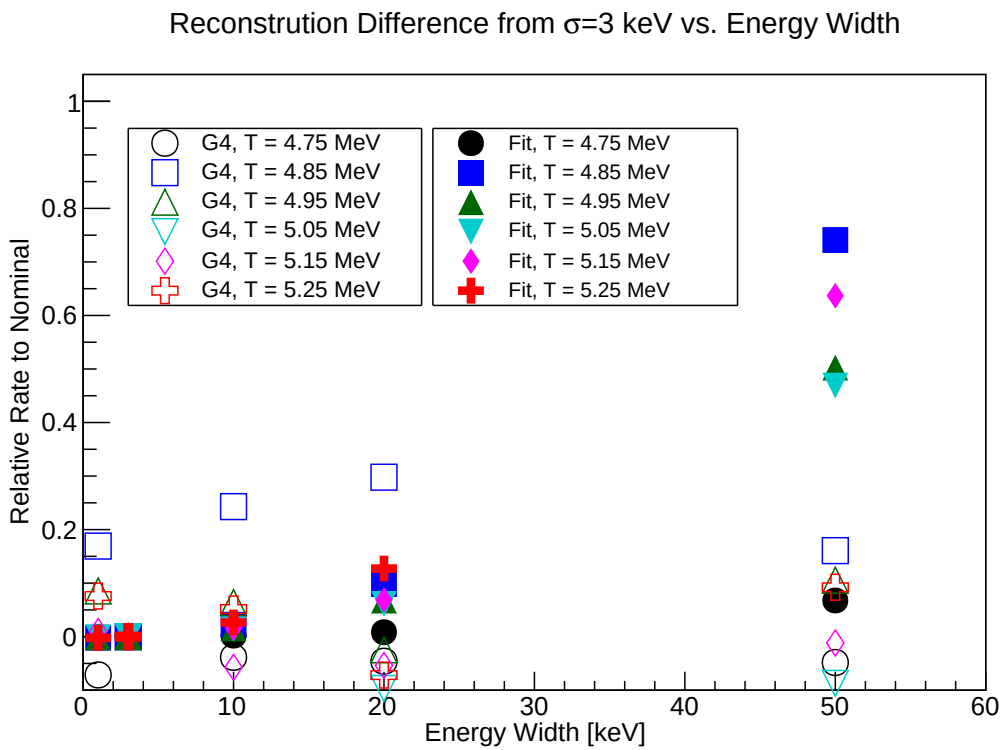


Shiff Fit with Softening



- Shiff function cuts off too quickly compared to simulation
- Mentioned last time, collisional losses in thick radiator before radiation will spread high energy endpoint
- Spread effectively an "energy width floor" - makes requirements easier
- On the order of effectively 10-20 keV in energy noise

Reconstruction Effects



- Assumed energy width of 3 keV as baseline
- Still some noise directly from G4 (open symbols)
- Refitting (solid symbols) smooths out
- 10 keV width or smaller is effectively only few percent noise in reconstruction