



Fixes to LANL $^{232,237,239}\text{U}(n,\gamma)$, (n,f) and $(n,2n)$ cross section evaluations

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- Tasked to update LLNL's ENDL database for “all” actinides
- Start w/ U accretion/depletion cross sections
- Steal best evaluations wherever possible
- Customer wanted uncertainty estimates

Overview of most dramatic fixes, but there are others that would benefit from fix: ^{233}U , ^{234}U , ^{236}U

Competition Corrections



We calculate c.s. w/ Hauser-Feschbach:

$$\sigma_\gamma \sim \sigma_{\text{abs}} \frac{\Gamma_\gamma}{\Gamma_\gamma + \Gamma_f + \Gamma_{CE} + \dots}$$

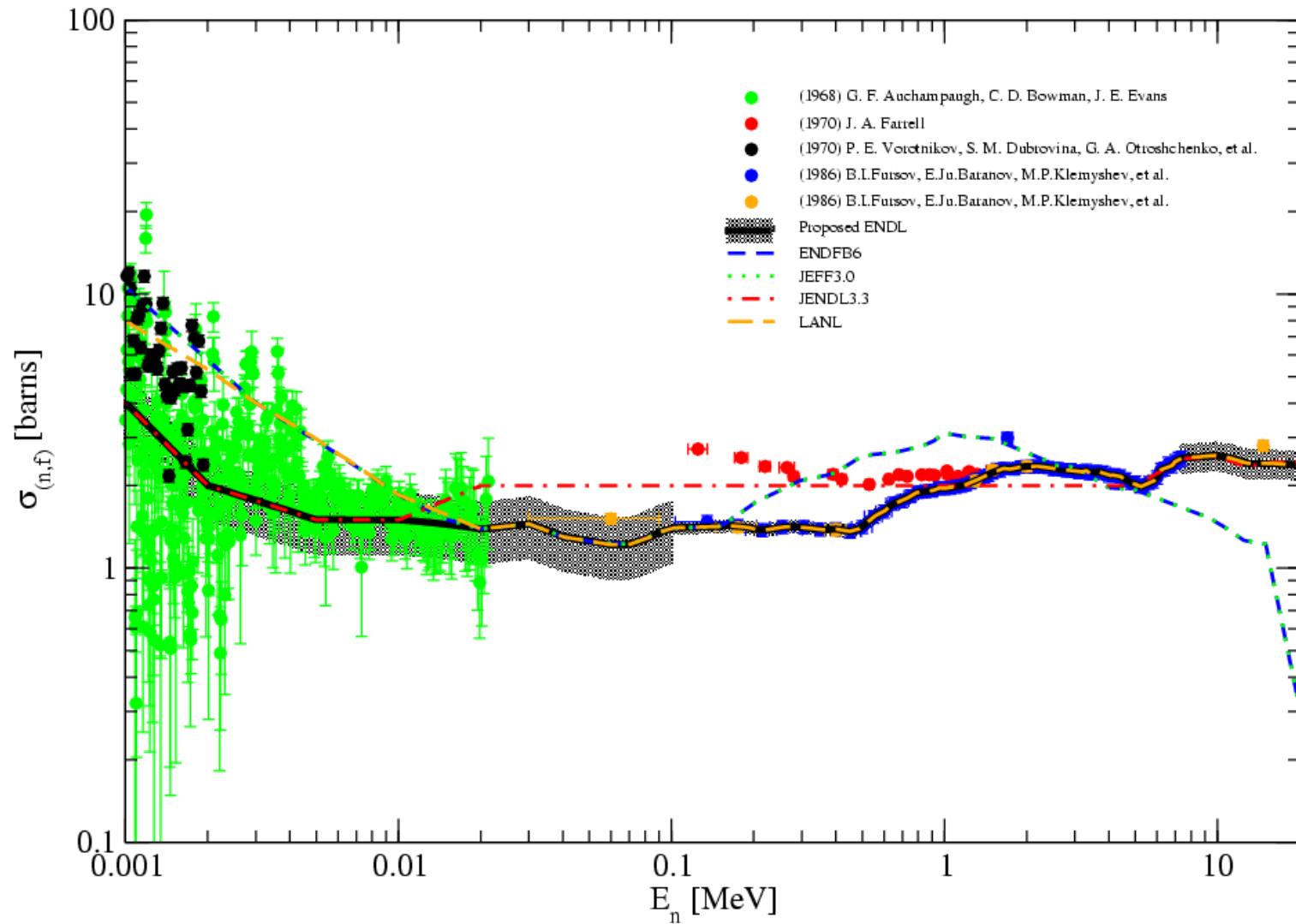
What if this is calculated wrong?
(we know because it's measured!)

Simple minded correction (ignores spinology):

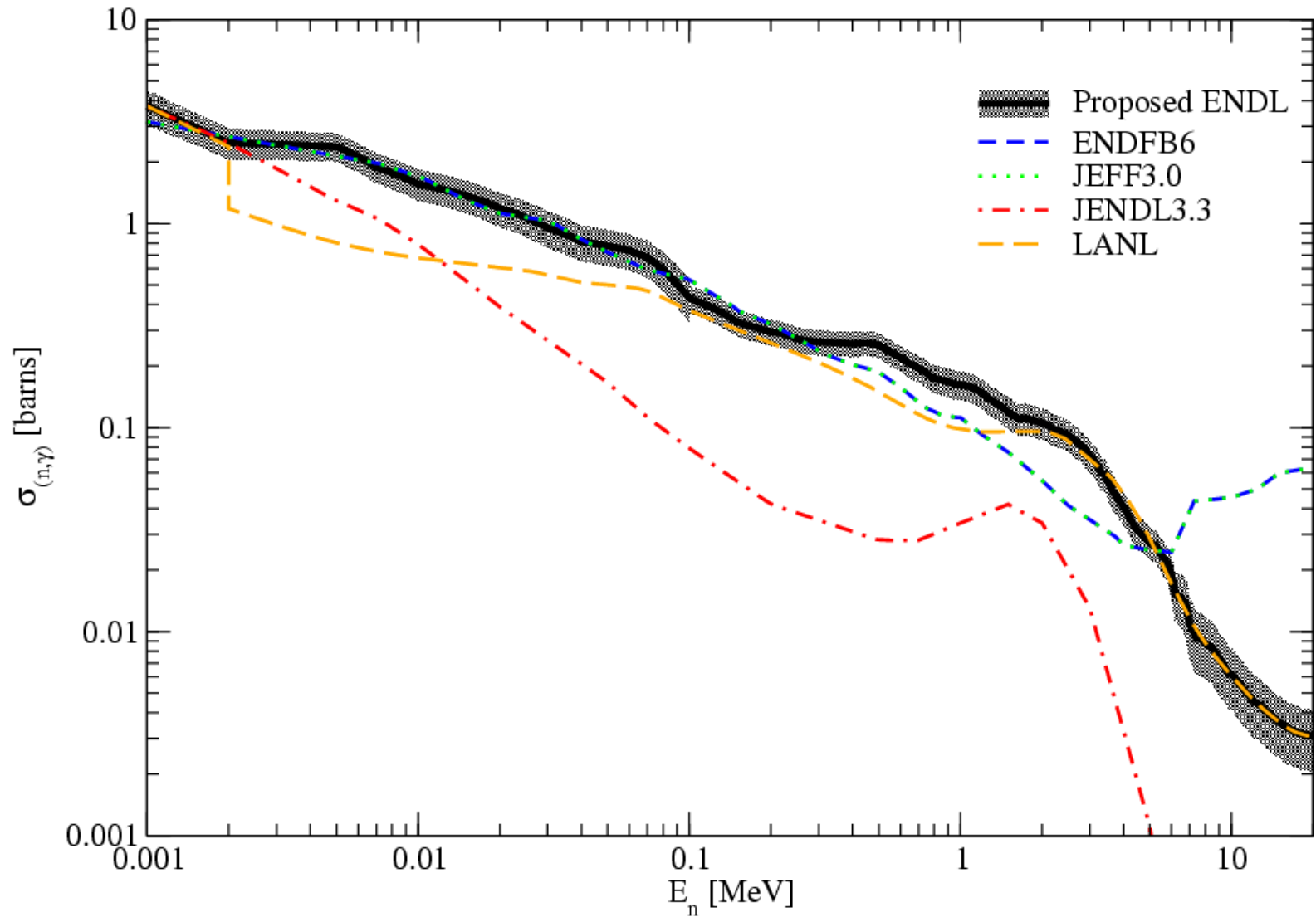
$$\sigma_x^{\text{fixed}} = \sigma_x^{\text{orig}} + \left(\sigma_f^{\text{orig}} - \sigma_f^{\text{fixed}} \right) \frac{\sigma_x^{\text{orig}}}{\sigma_{CE} + \sigma_\gamma + \sigma_{(n,n')} + \dots}$$

$$\frac{\delta \sigma_x^{\text{fixed}}}{\sigma_x^{\text{fixed}}} \approx \sqrt{\left(\frac{\delta \sigma_x^{\text{orig}}}{\sigma_x^{\text{orig}}} \right)^2 + (\delta \sigma_f^{\text{fixed}})^2 \left(\frac{\sigma_x^{\text{orig}} / \sigma_x^{\text{fixed}}}{\sigma_{CE} + \sigma_\gamma + \dots} \right)^2}$$

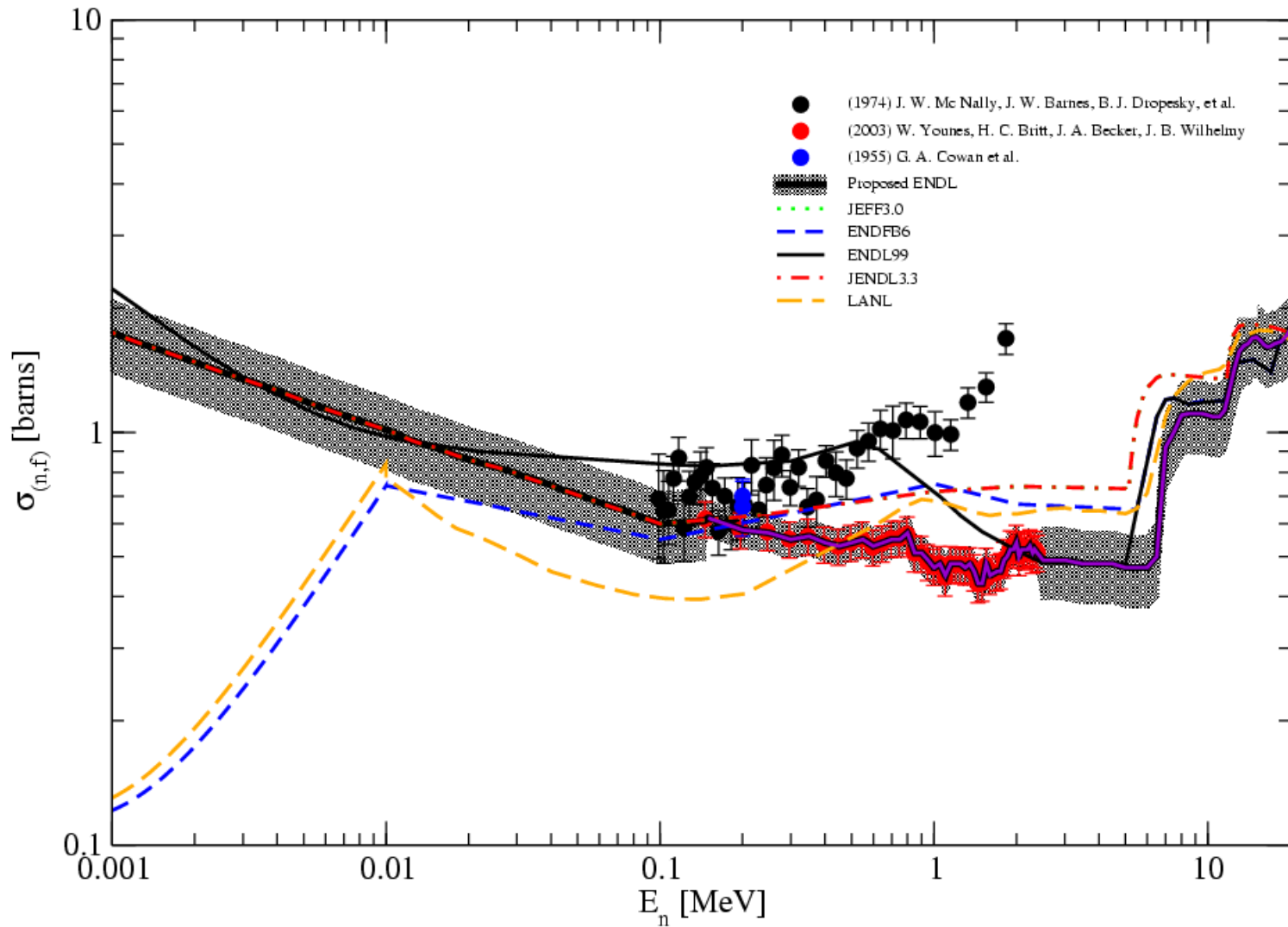
$^{232}\text{U}(n,f)$



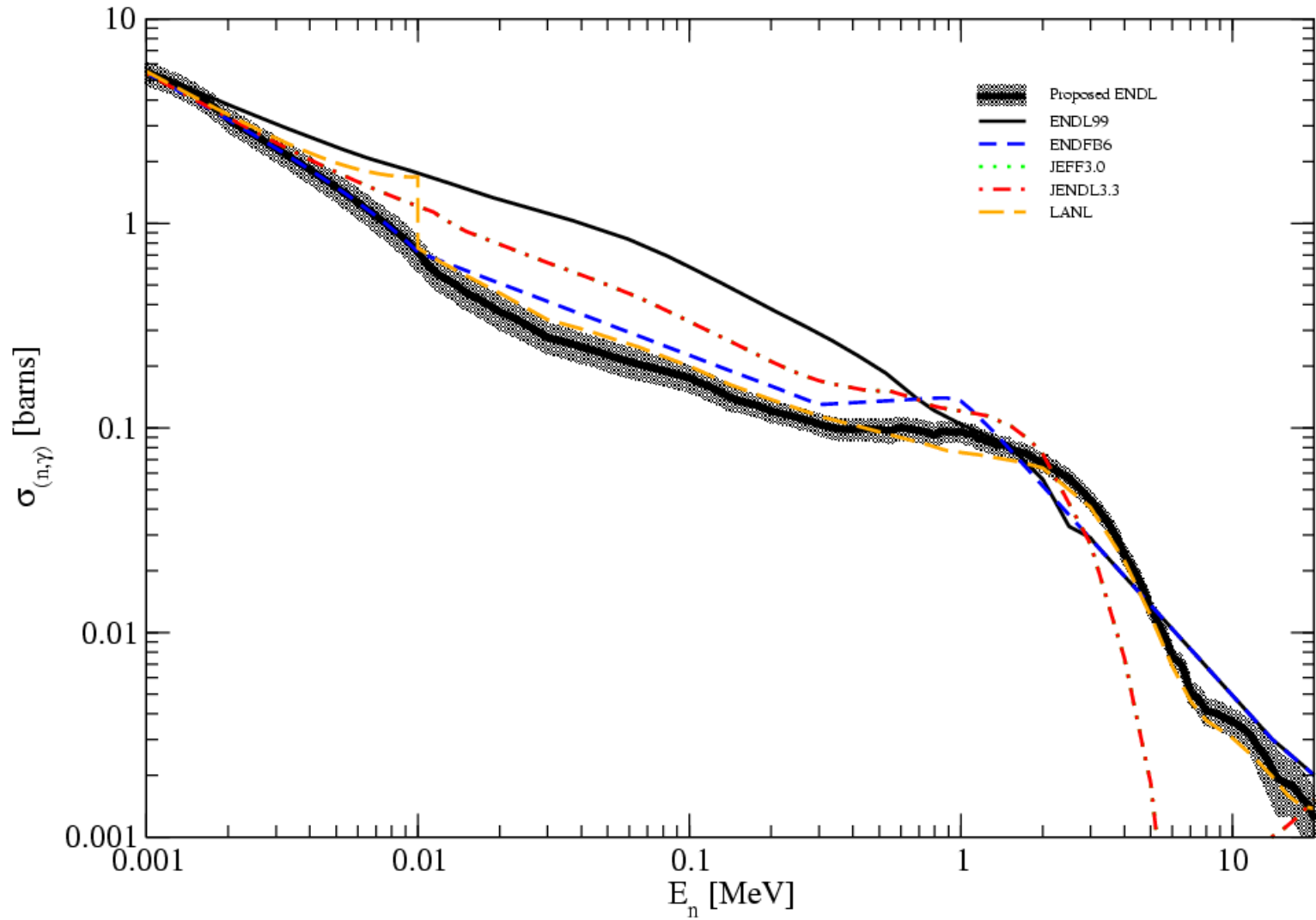
$^{232}\text{U}(n,\gamma)$



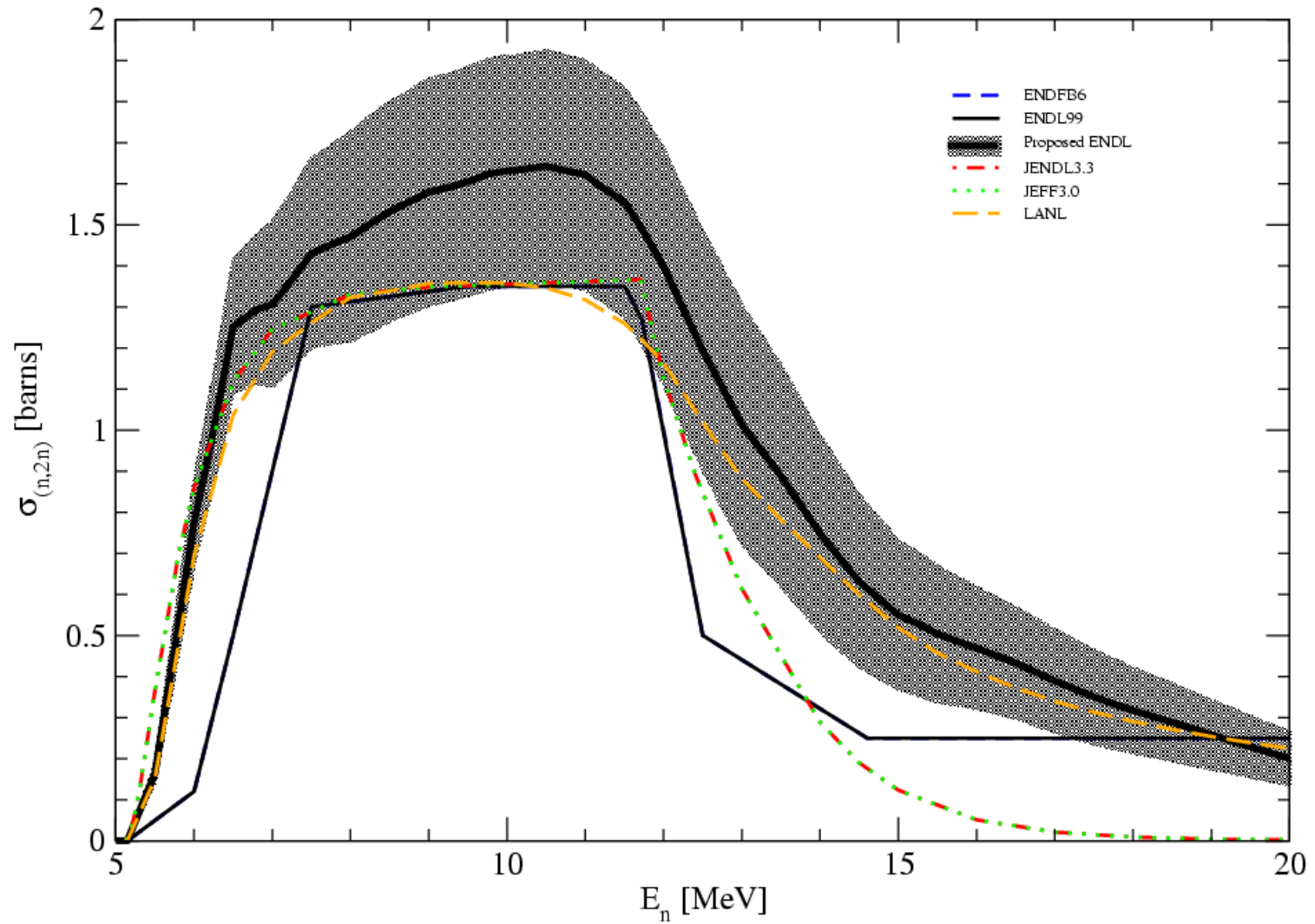
$^{237}\text{U}(n,f)$



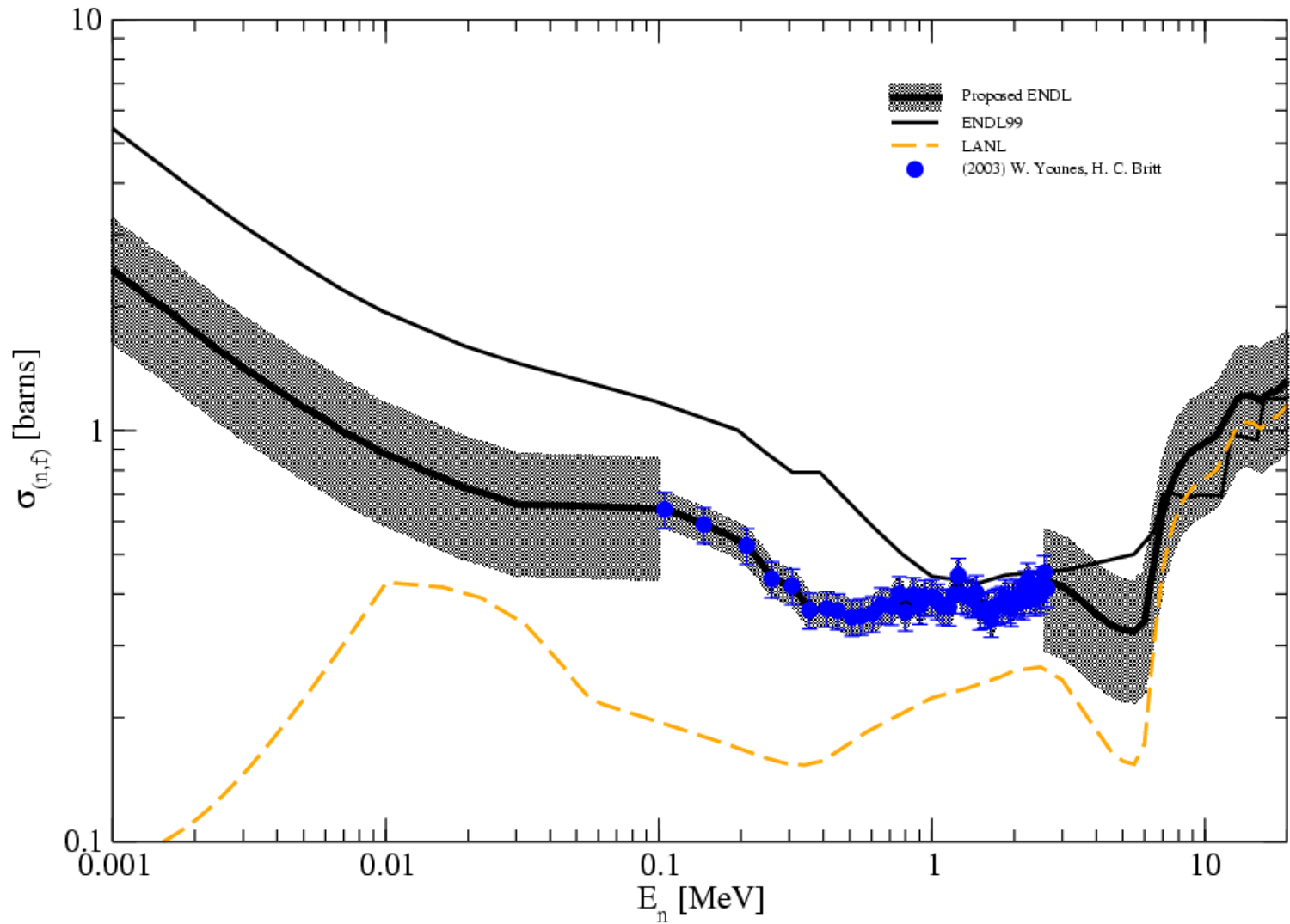
$^{237}\text{U}(n,\gamma)$



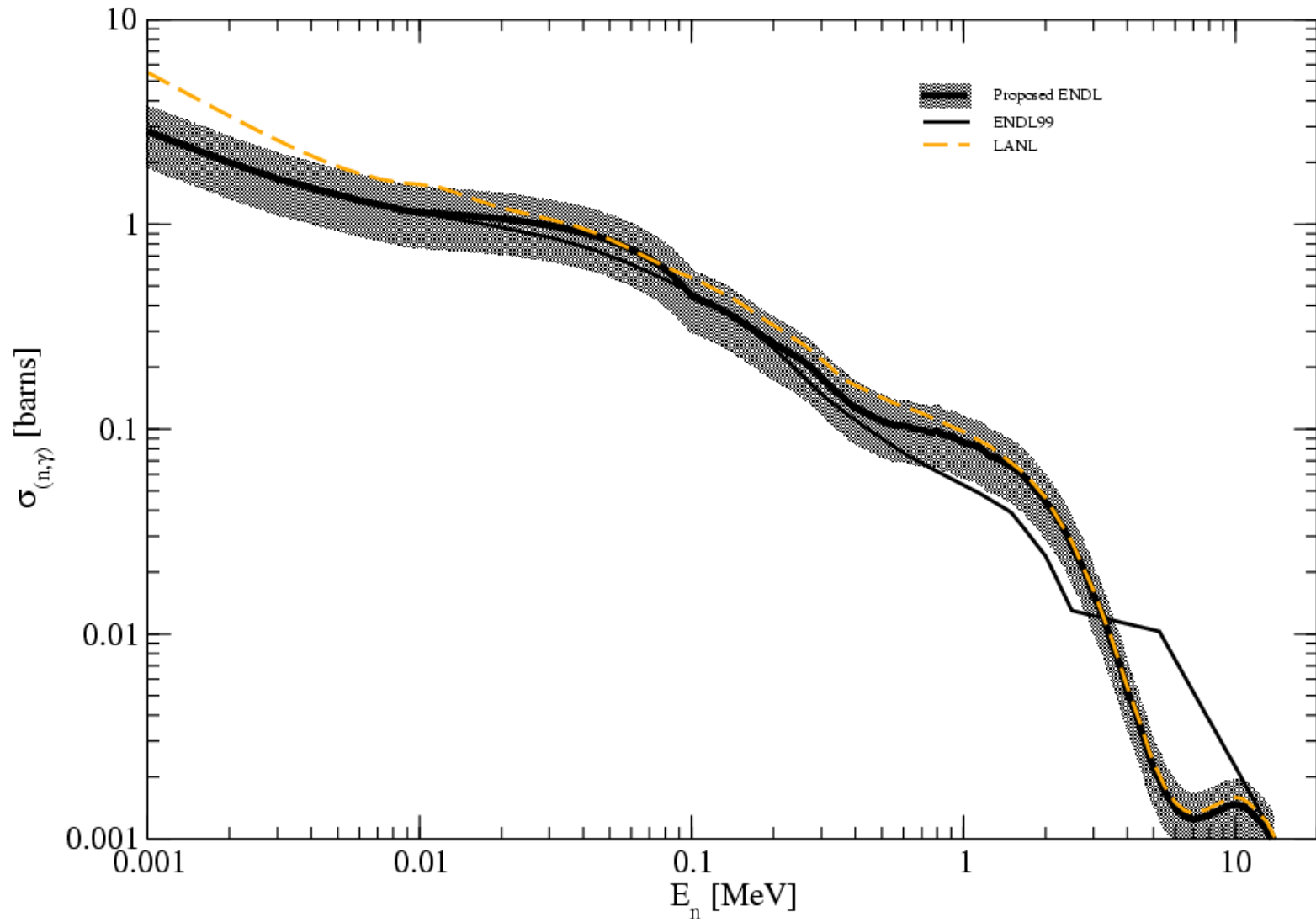
$^{237}\text{U}(n,2n)$



$^{239}\text{U}(n,f)$



$^{239}\text{U}(n,\gamma)$



$^{239}\text{U}(n,2n)$

