

New Evaluation of Ta181



M.Herman, T Kawano

11/30/2020



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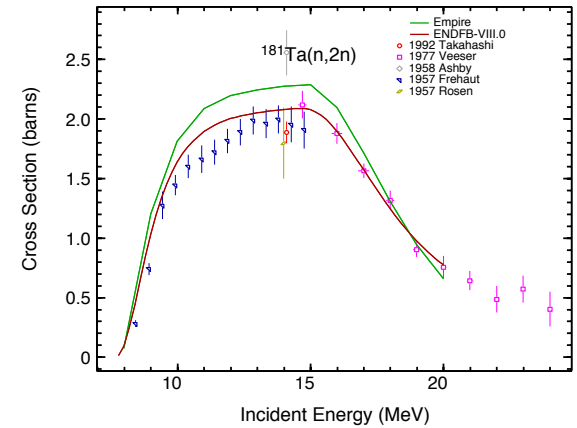
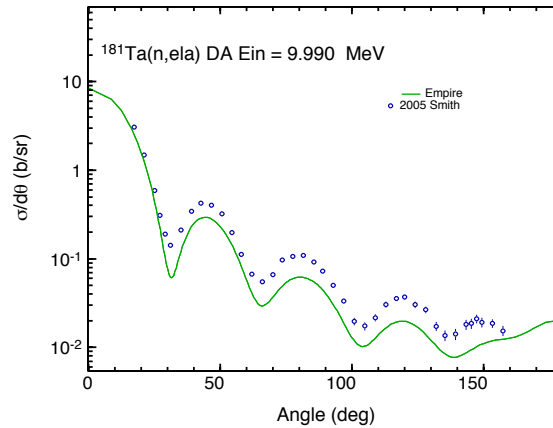
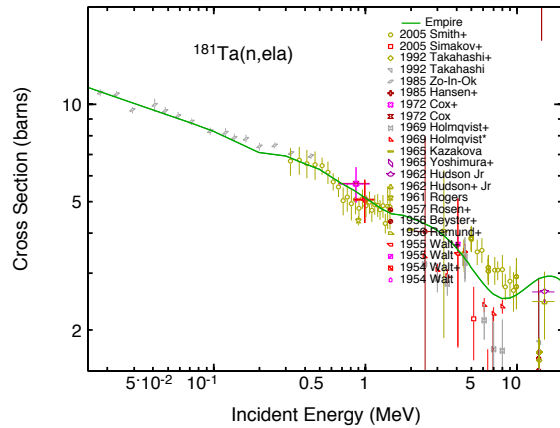
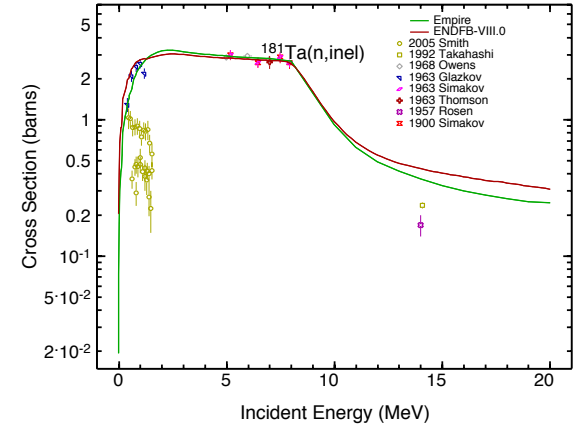
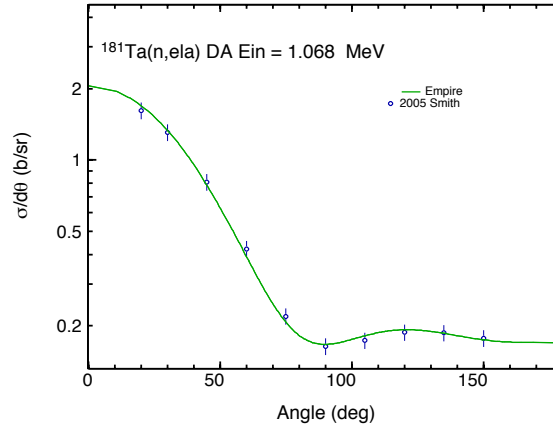
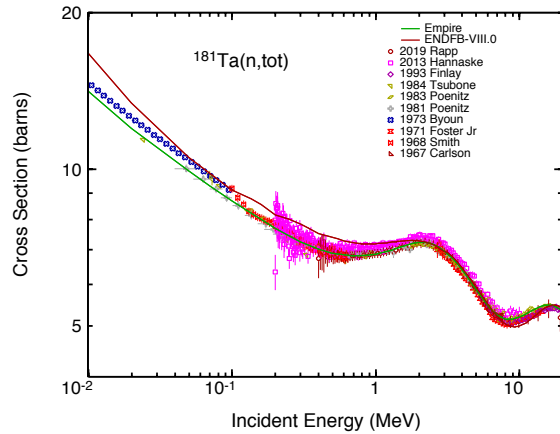
Summary

- New evaluation of n-induced reactions on ^{181}Ta up to 20 MeV.
- Motivation: ENDF/B-VIII.0 “...created by running Talys with default input parameters. ...not tested against experimental data ... only as good as the global quality of Talys. ”
- New theory: dispersive CC, MSC, MSD, EW transformation, Direct-Semidirect capture, MSC capture, M1 scissor mode.
- Experimental data: very extensive (easy target).
- Validation planned: PU-MET-FAST-045 (weak sensitivity, not much expectation)

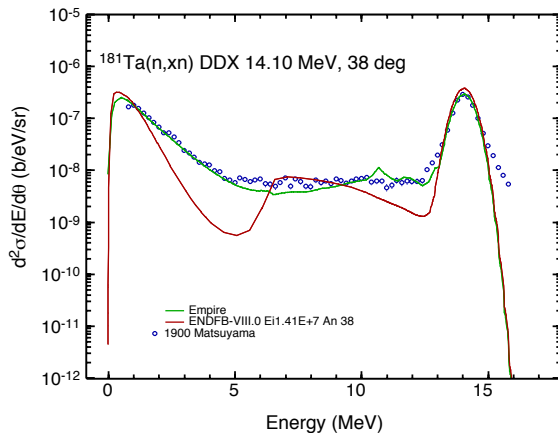
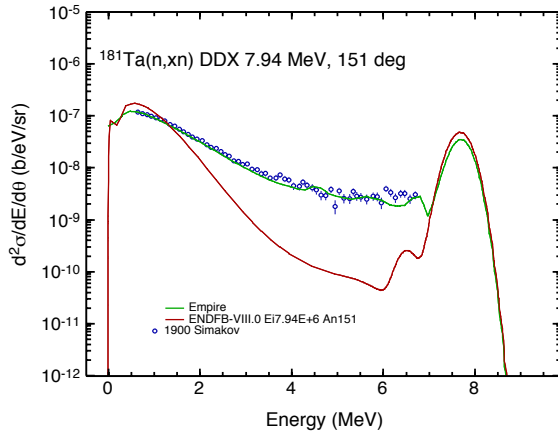
Modeling (Empire-3.2.3 rev. 5258+)

- Disp. CC optical potential (RIPL-3 #610, Capote+) slightly adjusted to total and elastic ang. distr. (mostly reduced deformations)
- Preequilibrium: NVWY Multistep Compound + TUL Multistep Direct
- Hauser-Feshbach
 - Gilbert-Cameron level densities
 - MLO1 gamma strength functions
 - M1 scissor mode (from CoH3)
 - Moldauer width fluctuation correction with Kawano-Talou # of degrees of freedom
 - Direct-Semidirect capture (from CoH3)
 - Engelbrecht-Weidenmueller transformation

Results - comparison with ENDF/B-VIII.0



Conclusions



- Lot of experimental data isn't an evaluators' paradise 🤔
- Selecting exp data and curating them
- Choosing modeling options
- Maintaining consistency
- Using fitting only when a problem is well defined
- Still to do
 - M1 + Direct-SemiDirect
 - Level density adjustment
 - Covariances

All what it takes
(so far...)

OM- r_v 0.98542

OM- V_v 1.0184

OM- a_v 1.0870

OM- β_2 1.0444

OM- β_4 0.93707

OM- β_6 0.49351

MSD- l_0 6.38