

The predictive power of TALYS

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An attempt is made to quantify the predictive power of the TALYS nuclear reaction model code for neutron-induced reactions up to 30 MeV. Special emphasis is put on the neutron capture channel in the fast energy range, but all other reaction channels up to 30 MeV will be covered as well. This uncertainty analysis is based on several prerequisites:

Modern descriptions of the nuclear level density and photon strength function,

An outlier-cleaned and computationally accessible version of the EXFOR database,

Sensitivity profiles for TALYS nuclear model parameters and their use in automated parameter optimization.

The global assessment of predictive power is based on a simultaneous analysis of all cross sections, MACS, and average radiative widths in the range $A=20-209$ for which experimental data exists. The main discussion point will then be to which extent the predictive power is applicable to short-lived nuclides.

Author: KONING, Arjan (IAEA)

Presenter: KONING, Arjan (IAEA)

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