

## Nuclear Data for the Next Decade



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### Modeling for nuclear data: state-of-the-art and future perspectives

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Nuclear reaction modeling for producing reliable nuclear data above the resonance region has been improved significantly in the last decade, and nuclear data evaluation based on theoretical model calculations is a common technique to produce the evaluated nuclear data libraries nowadays. Having said that, all of the models employed in the nuclear data production are not necessarily fully matured. Nuclear reaction data produced by available nuclear data production tools such as the statistical Hauser-Feshbach codes, which could have some compensations, may give a decent fit to the experimental data, albeit internally calculated quantities may not reflect the reality. One example is a pre-equilibrium model currently implemented in these nuclear data codes. Although it gives a reasonable particle emission spectrum, the calculated gamma-ray emission does not reproduce the experimental data. In this paper, we summarize the nuclear reaction models currently used in the nuclear data studies, then discuss what are the crucial subjects we need to address to improve the nuclear data for science and technology. The subjects include neutron scattering, capture, and fission. [LA-UR-25-32301]

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