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**Analysis of Astrophysical Reaction Rates Using ENDF/B-VIII.0
and TENDL-2015 Libraries in 0.01-10 GK Range of Temperatures**[1] BORIS
PRITYCHENKO, Brookhaven National Laboratory — Recent observations of neutron stars merger (GW170817) renewed interest in stellar nucleosynthesis calculations. Stellar nucleosynthesis modeling requires fully traceable, unbiased, high fidelity nuclear data. The Evaluated Nuclear Data File (ENDF) libraries contain complete collections of reaction data sets over the nuclear industry standard 10^{-5} eV - 20 MeV energy span. For the first time (n,γ), (n,fission), (n,p), and (n,α) astrophysical reaction rates were computed within 0.01-10 GK range of temperatures using ENDF/B-VIII.0 and TENDL-2015 libraries, and REACLIB fit parameters were deduced. The present results were used to estimate the slow neutron capture timescale for multiple libraries. These findings demonstrate the potential astrophysical applications of the ENDF libraries and the complementary relations between the nuclear industry and astrophysics data developments.

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