REACLIB Parameterization of NACRE Data

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Thermonuclear reaction rates are used in models of a wide variety of astrophysical phenomena, such as exploding stars and the inner workings of our sun. The widely-used REACLIB library [1] contains parameters in a uniform format representing ~ 8000 reaction rates as a function of temperature. However, a recent evaluation of 80 reaction rates by the NACRE collaboration [2] has not been added to this library. Computer programs were written to generate REACLIB parameters to fit the NACRE reaction rates to within 2% accuracy. This often involved investigating the low temperature behavior of the NACRE fits with the aid of programs to plot the rates and contributions of individual parameters. These programs can be used in the future to obtain REACLIB parameters for other evaluated reaction rates. Fitting results and techniques from this analysis will be presented.

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2. C. Angulo et al., Nucl. Phys. **A656**, 3 (1999).