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Calculating Absolute Transition Probabilities for Deformed Nuclei in the Rare-Earth Region[1] ANNE STRATMAN, CLARK CASARELLA, ANI APRAHAMIAN, University of Notre Dame — Absolute transition probabilities are the cornerstone of understanding nuclear structure physics in comparison to nuclear models. We have developed a code to calculate absolute transition probabilities from measured lifetimes, using a Python script and a Mathematica notebook. Both of these methods take pertinent quantities such as the lifetime of a given state, the energy and intensity of the emitted gamma ray, and the multipolarities of the transitions to calculate the appropriate B(E1), B(E2), B(M1) or in general, any B($\sigma\lambda$) values. The program allows for the inclusion of mixing ratios of different multipolarities and the electron conversion of gamma-rays to correct for their intensities, and yields results in absolute units or results normalized to Weisskopf units. The code has been tested against available data in a wide range of nuclei from the rare earth region (28 in total), including $^{146-154}$Sm, $^{154-160}$Gd, $^{158-164}$Dy, $^{162-170}$Er, $^{168-176}$Yb, and $^{174-182}$Hf. It will be available from the Notre Dame Nuclear Science Laboratory webpage for use by the community.

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Anne Stratman
University of Notre Dame

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