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Constraining Nuclear Level Densities Using the Shape Method and Related CRP Research Activities

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Knowledge of nuclear level densities (NLD) is essential for applications in nuclear astrophysics, reactor physics, and nuclear security. The Oslo Method, a widely used technique for extracting NLDs, typically requires neutron resonance spacing data, which is unavailable for many nuclei of interest. In this presentation, I will review the novel Shape Method, which provides a model-independent approach to constraining NLDs even in the absence of neutron resonance data. Through the relative energy dependence of primary γ -ray transitions, the Shape Method enables constraints on NLDs, improving their reliability.

Additionally, I will briefly discuss the US Nuclear Data Program-funded quasi-continuum data evaluator training, which supports expertise development relevant to this coordinated research project (CRP). Finally, I will outline the key NLD tasks planned for this CRP, including the collection of experimental NLD data, their assessment and evaluation.

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