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Constraining Neutron Capture Rates in Exotic Nuclei

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Accurate neutron capture rates for unstable nuclei are essential for nuclear data evaluations and for improving reaction network calculations. A promising approach combines radioactive ion beams with the Oslo method, which extracts nuclear level densities and γ-ray strength functions to indirectly constrain capture rates. The β-Oslo technique extends this capability to beam intensities down to ~1 particle per second, enabling measurements on highly exotic isotopes and greatly expanding the range of nuclei accessible compared to other indirect methods. I will review the status and challenges of applying the Oslo method with exotic beams, including developments with (d,p) reactions. Specific topics include the "shape"method, absolute normalization issues, and strategies for "breeding"capture products one to two steps from stability for cross section determination via accelerator mass spectrometry (AMS). While the emphasis is on measurement techniques and data, I will briefly note the relevance of these efforts for constraining i-process and r-process nucleosynthesis models.

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