

Neutron capture by any means necessary

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Abstract:

Knowledge of nuclear reactions in general, and neutron capture cross sections in particular, are necessary to understand both heavy element nucleosynthesis and applications in nuclear energy and defense. While many nuclei of interest lie on or near the valley of stability and can be studied directly, many more are beyond the reach of any direct measurement. We've developed a multi-probe approach to understand the neutron capture reaction both for stable and short-lived nuclides, using beams available at the LANSCE and ATLAS facilities. I will present an overview of the experimental techniques and ongoing efforts for ^{239}Pu , ^{96}Zr , and ^{60}Fe , as well as some of the technical challenges associated with the measurements and future directions.