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Measurement of (p,n) reactions at astrophysical energies using recoil separators PANAGIOTIS GASTIS, Los Alamos National Laboratory, GEORGE PERDIKAKIS, ALFREDO ESTRADE, MIHAI HOROI, MATTHEW REDSHAW, PELAGIA TSINTARI, KAILONG WANG, Central Michigan University, SEAN LIDDICK, SAMUEL LIPSCHUTZ, ALICIA PALMISANO, THOMAS REDPATH, JACLYN SCHMITT, JONATHAN SHEEHAN, REMCO ZEGERS, Michigan State University, GEORG BERG, ALEXANDER DOMBOS, University of Notre Dame, FERNANDO MONTES, JORGE PEREIRA, JASPREET RANDHAWA, MALORY SMITH, National Superconducting Cyclotron Laboratory, STEPHANIE LYONS, Pacific Northwest National Laboratory, ASHTON FALDUTO, TU Darmstadt, ANTONIO VILLARI, Facility for Rare Isotope Beams —
We have developed an experimental technique for the measurement of (p,n) reactions with short-lived isotopes, using a stable hydrogen target, a neutron detector, and a recoil separator. In this presentation, we will discuss the details of the developed technique and the results from the first proof-of-principle experiment performed at the ReA3 facility at the National Superconducting Cyclotron Laboratory. In this experiment, partial cross-sections for the 40Ar(p,n)40K reaction were determined within an uncertainty of about 25%, by operating a section of the ReA3 beamline as a recoil separator. The new technique is expected to be used in experiments with the SECAR recoil separator at the Facility for Rare Isotope Beams and provide experimental data relevant to nuclear astrophysics.

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