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Stability of spectrum unfolding in extraction of neutron spectra for rare isotope beam physics[1] MICHAEL FEBBRARO, STEVEN PAIN, Oak Ridge National Laboratory, REBECCA TOOMEY, Rutgers University, FREDERICK BECCHETTI, University of Michigan, THOMAS MASSEY, ZACH MEISEL, Ohio University, RICHARD DEBOER, University of Notre Dame, CARL BRUNE, Ohio University — As the FRIB era approaches, it is important that the tools and techniques are in place to maximize scientific capabilities of such facilities. Neutron spectroscopy for transfer reaction physics is one important area which tools and techniques are needed. Traditionally, neutron time-of-flight (ToF) detectors have been used for extraction of neutron energy spectra. While this is a proven technique, the method often suffers from poor energy resolution for short flight paths. This can be improved by increasing the flight path, but at a cost to detection efficiency. An alternative method - based on a combination of short-path ToF and spectrum unfolding - maximizes detection efficiency without sacrificing energy resolution. The stability of the approach for low-statistics data has been investigated using neutron beams from the Edwards Accelerator Laboratory at Ohio University. Application of the technique for the measurement of single nucleon transfer reactions important for nuclear astrophysics will be discussed.

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