

Unfolding the fast neutron spectra with the thermal neutron component using Polysiloxane scintillators via neutron unfolding algorithms

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Abstract

Neutron spectroscopy is a method of measuring the neutron energies emitted from a radioactive source. This can be done using various methods, ranging from time-of-flight to proton recoil measurements. In this presentation, a method of neutron spectroscopy is explored using a single plastic scintillator capable of triple particle discrimination. This is done by measuring the light yield of the scintillator as a function of incoming neutron energy and using a computer algorithm to unfold the neutron spectrum. The primary algorithms explored are the GRAVEL, MLEM, and iterative Tikhonov methods. In addition, a Geant4 model is constructed to model the plastic scintillator used and produce results to be cross validated with experimental results. Current progress on the project has been completing a series of literature reviews, building a methodology, and constructing a Geant4 simulation.

