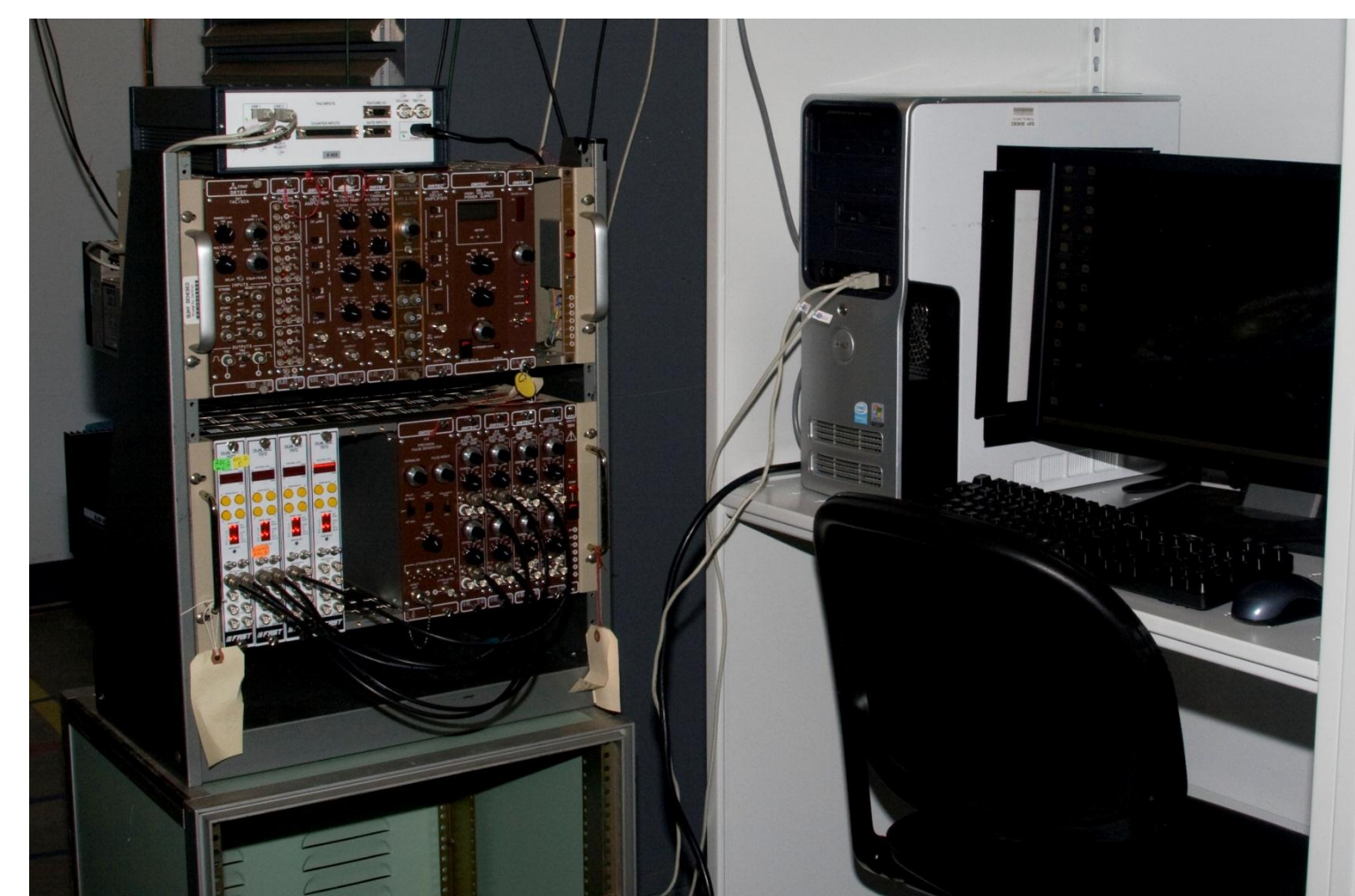
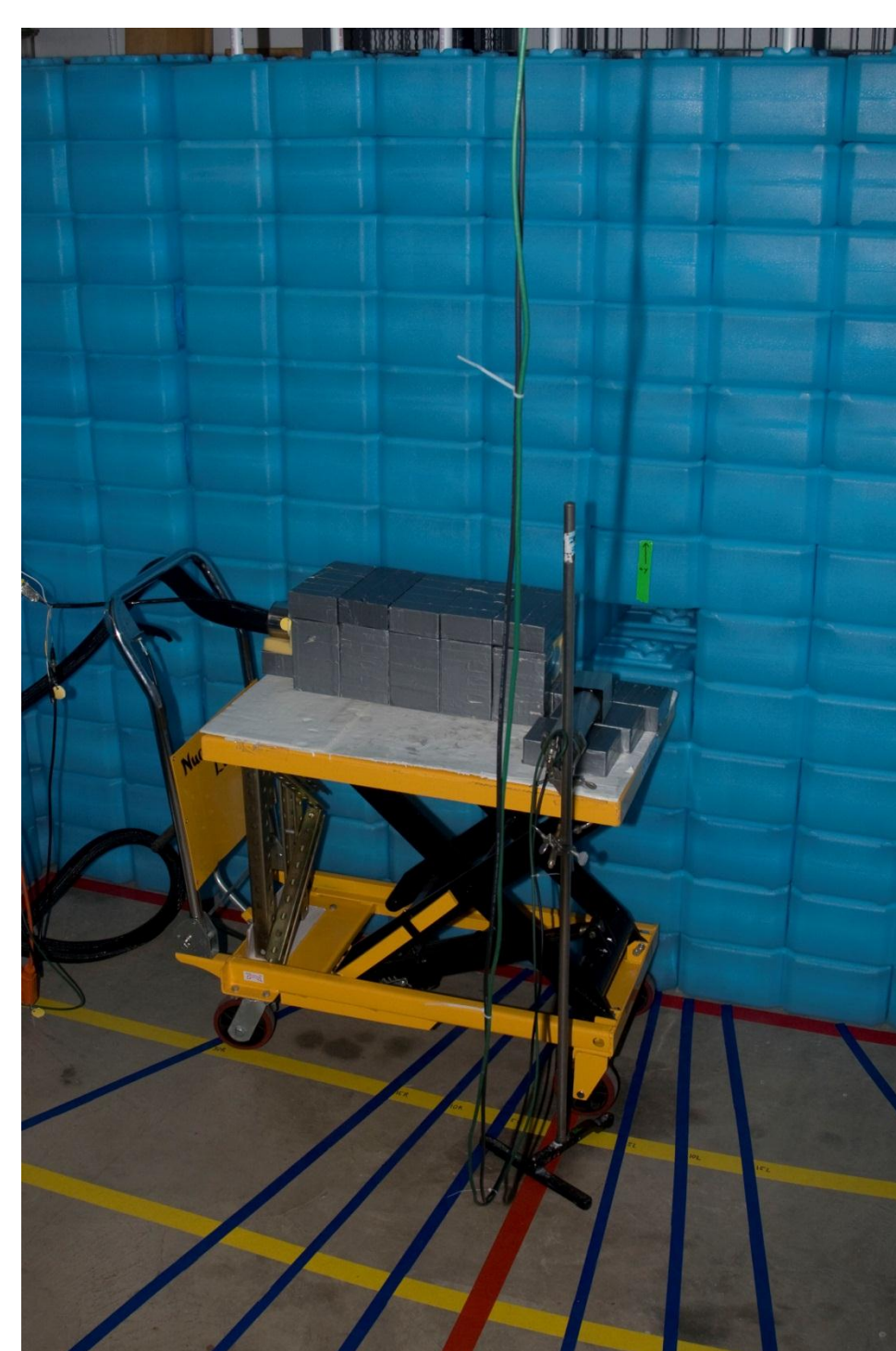


Design and Characterization of a Collimated Neutron Beam User Facility at SUNY Geneseo

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 Craig Sangster – Laboratory for Laser Energetics at the University of Rochester

Abstract

The Collimated Neutron Beam (CNB) Facility at SUNY Geneseo provides users an opportunity to perform neutron experiments that require a low neutron background. Neutrons with energies up to 10 MeV are produced by a Plutonium-Beryllium (Pu-Be) source and are collimated to form a well characterized beam. A six foot high, 18 inch thick shielding wall made of water-bricks was built to reduce neutron background in the target area. Neutron and gamma radiation were extensively mapped throughout the facility using a calibrated Bonner sphere, Geiger counter, plastic scintillator and an HPGe detector. Potential uses for the CNB include neutron activation, time-of-flight, attenuation and neutron detector calibration experiments.

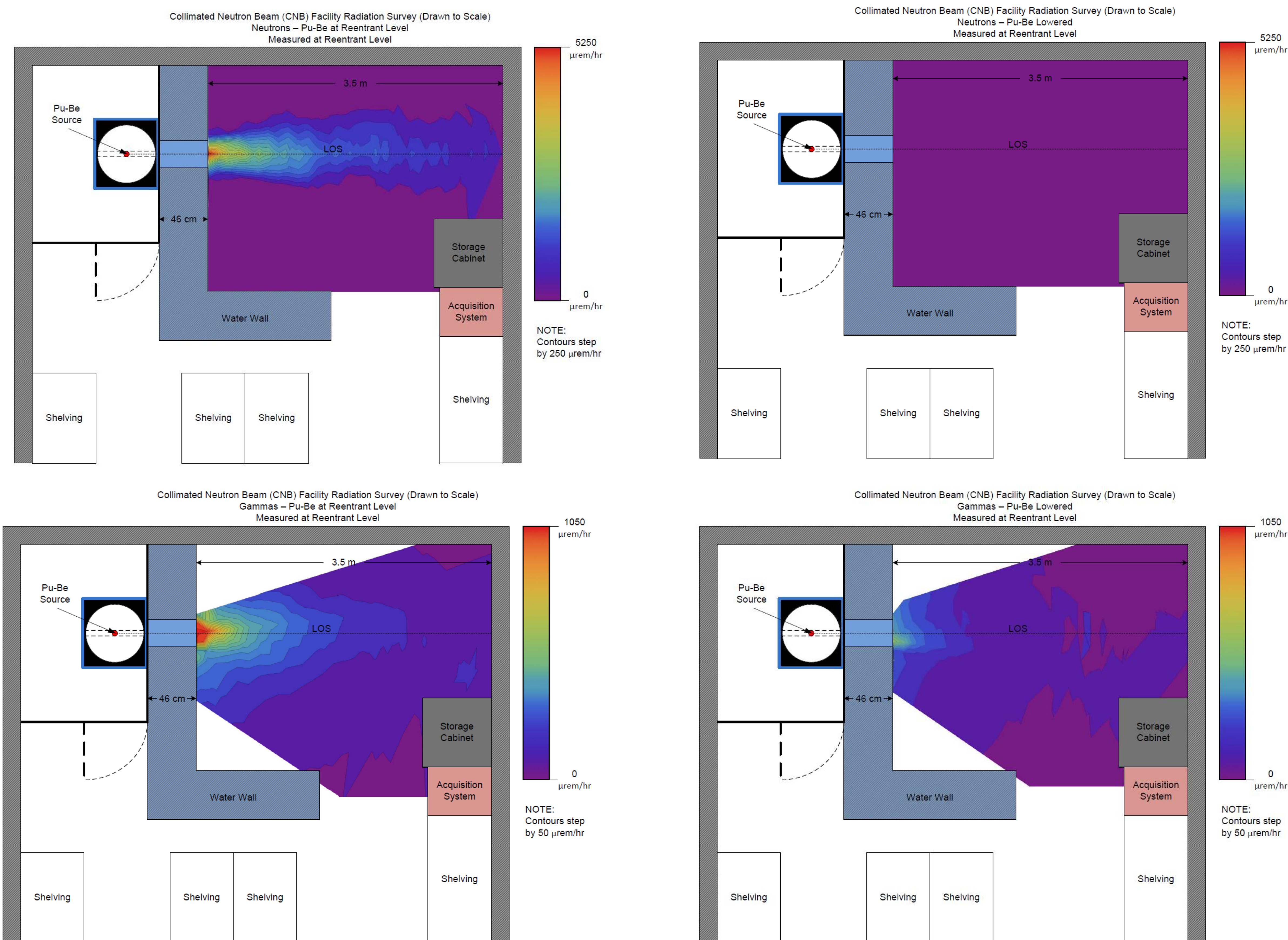


Acquisition system – MPA3

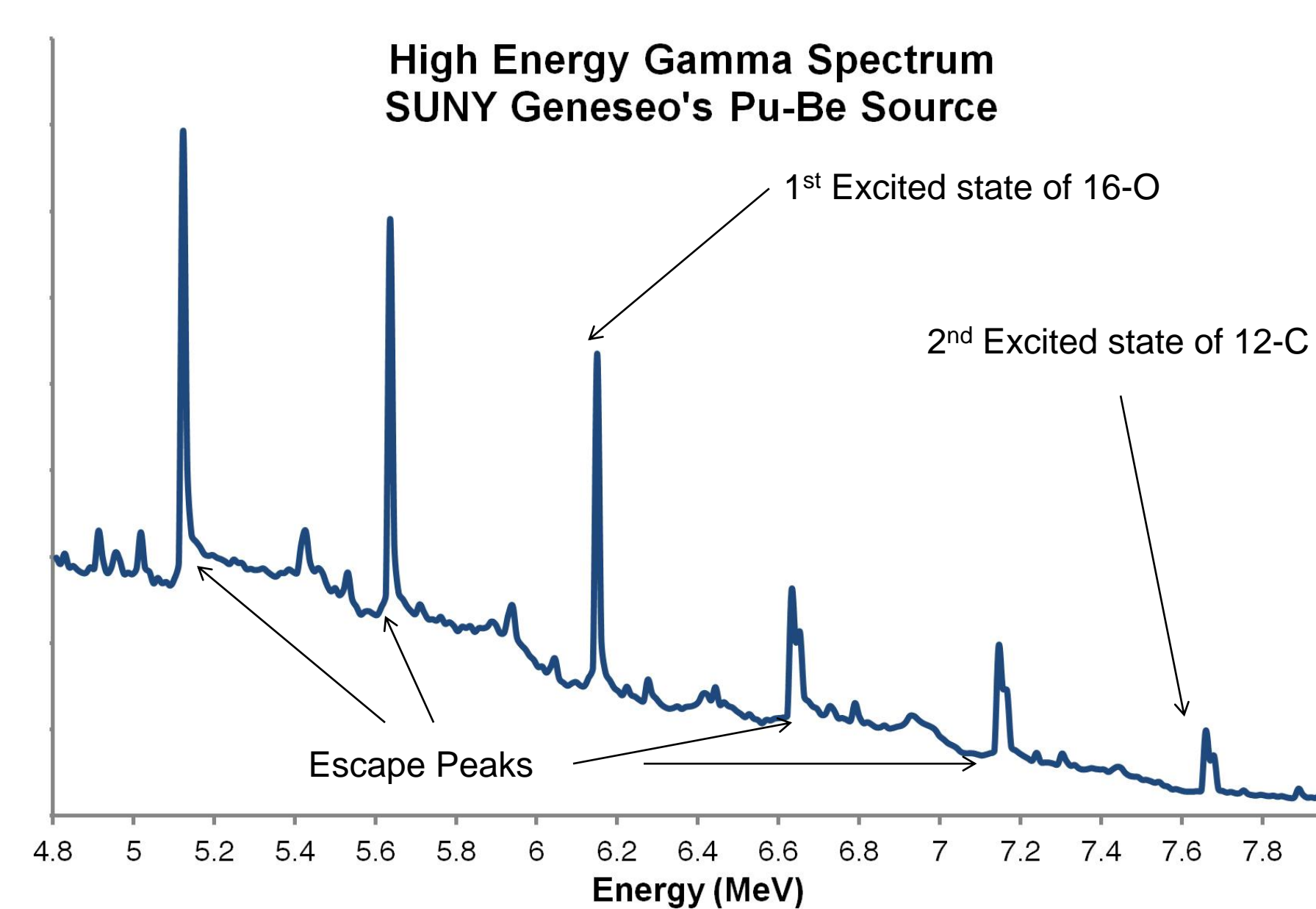
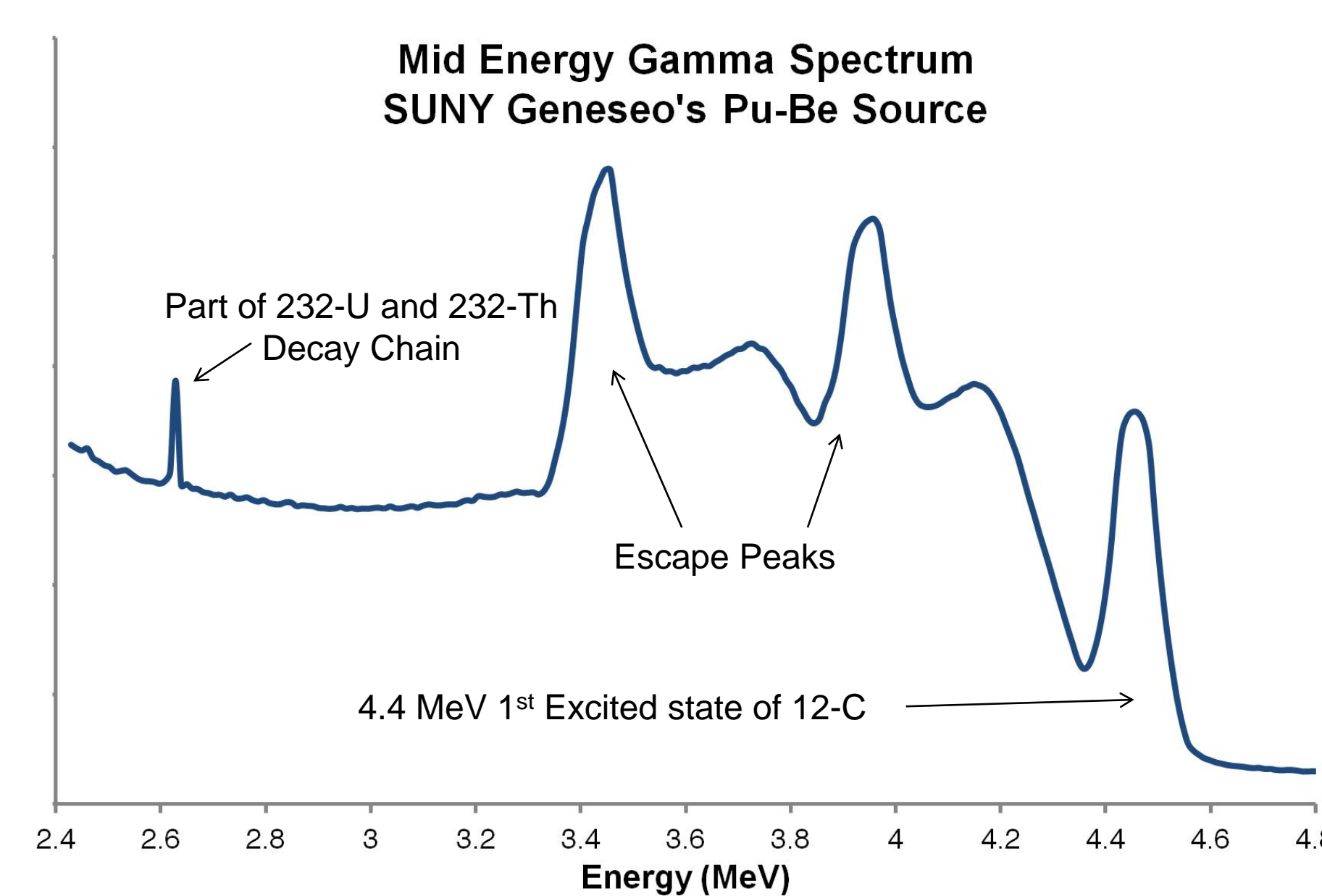
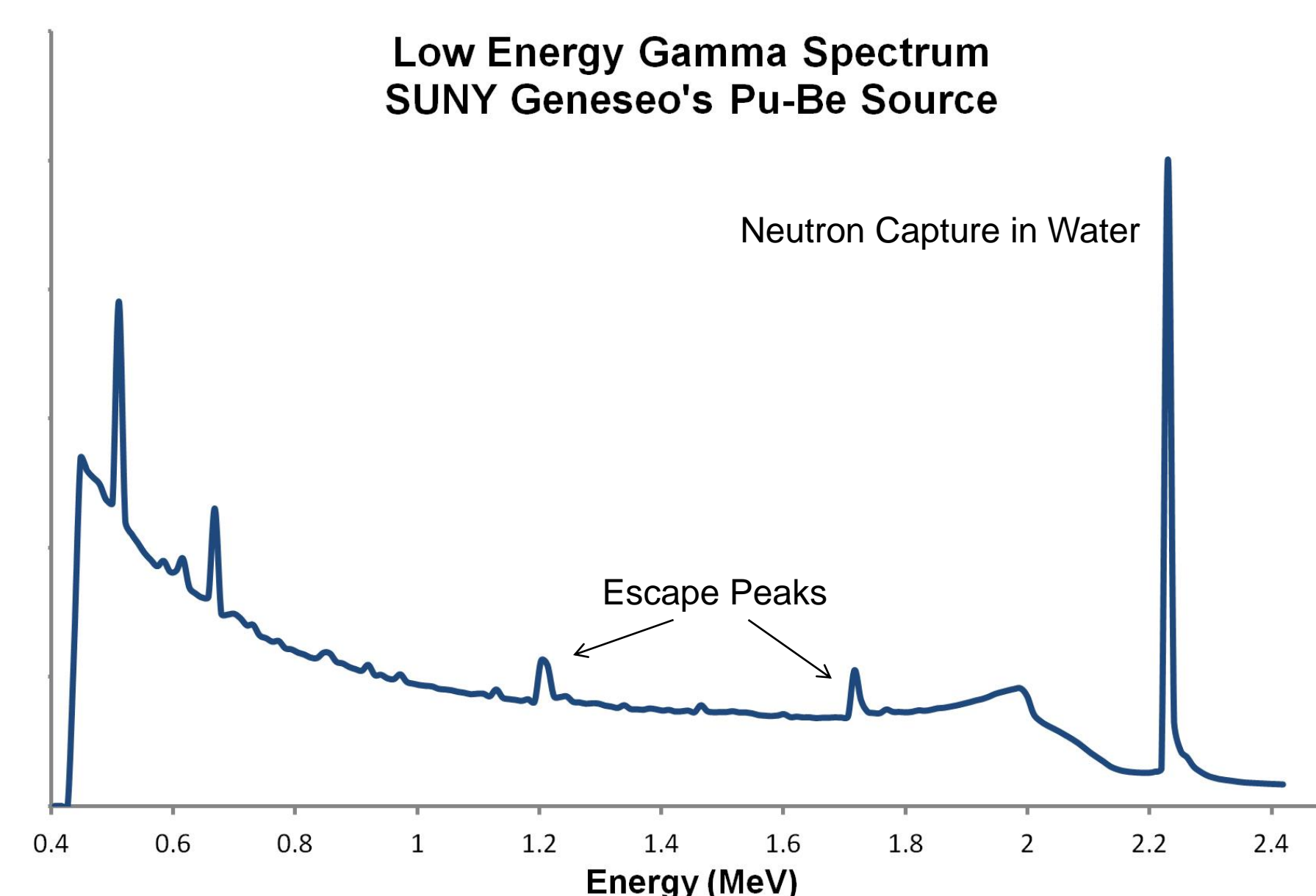
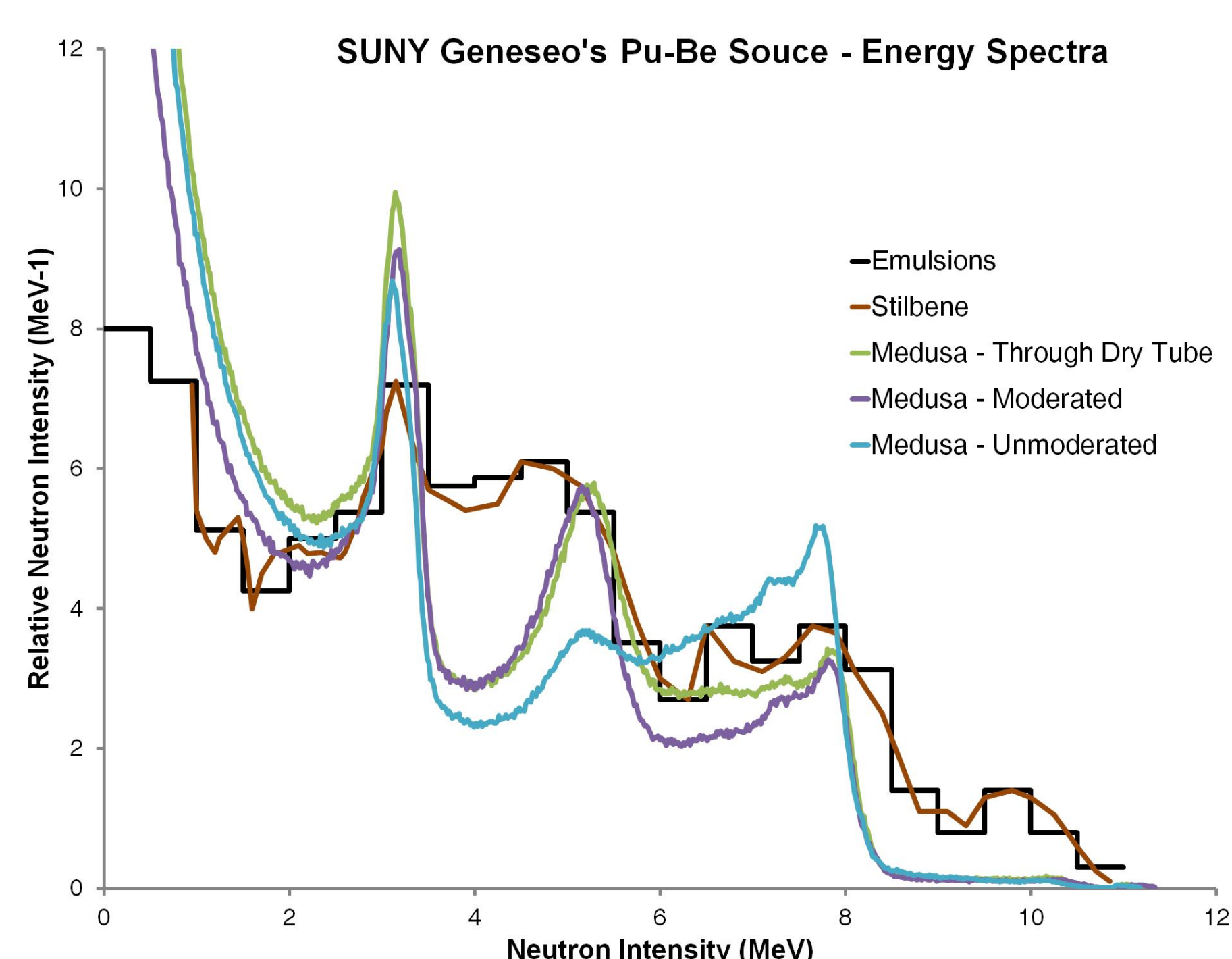
Geneseo's 5 Ci neutron Howitzer

Detectors set up in beam line

Construction and Background Radiation Mapping

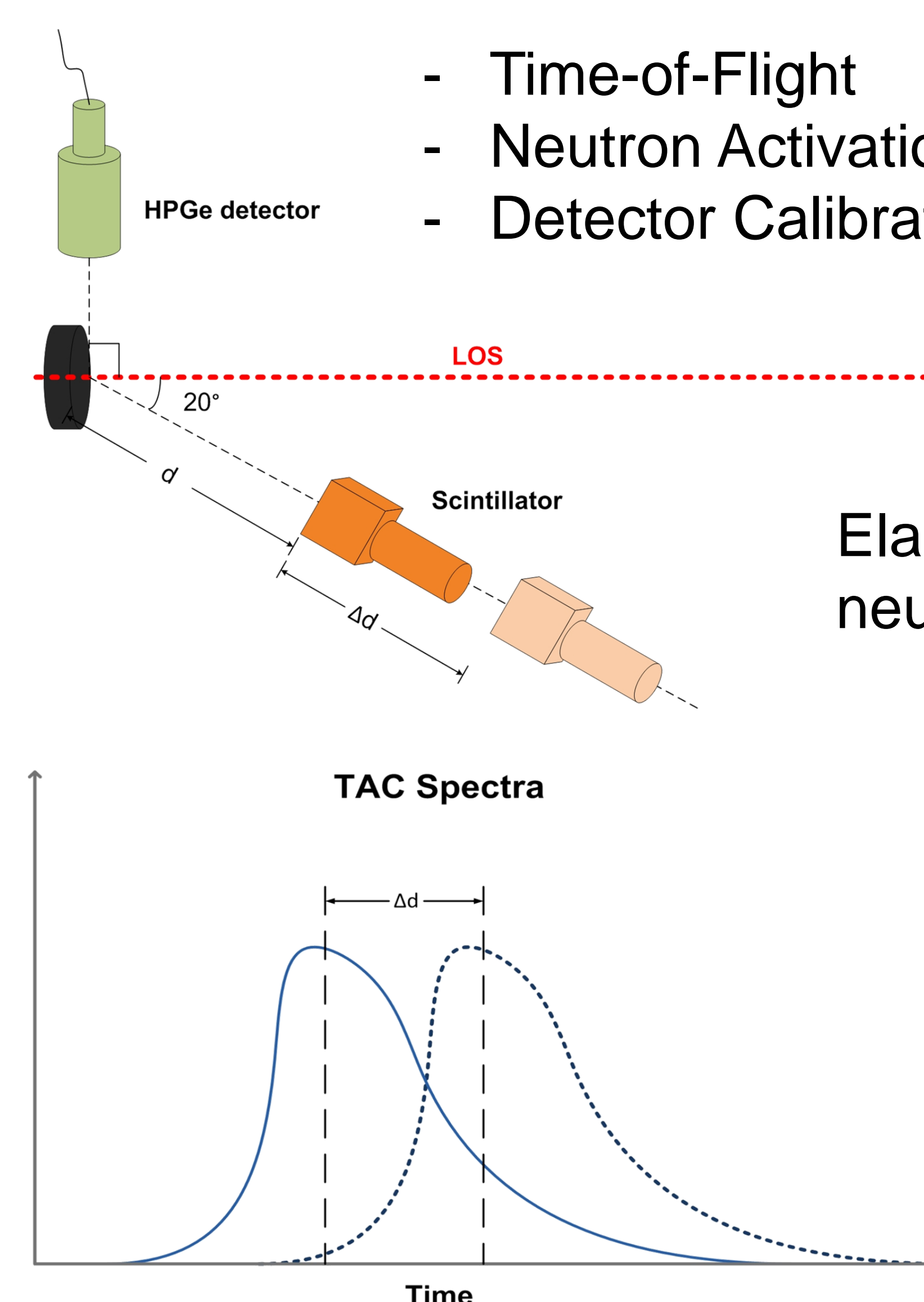


Characterization of Energy Spectra

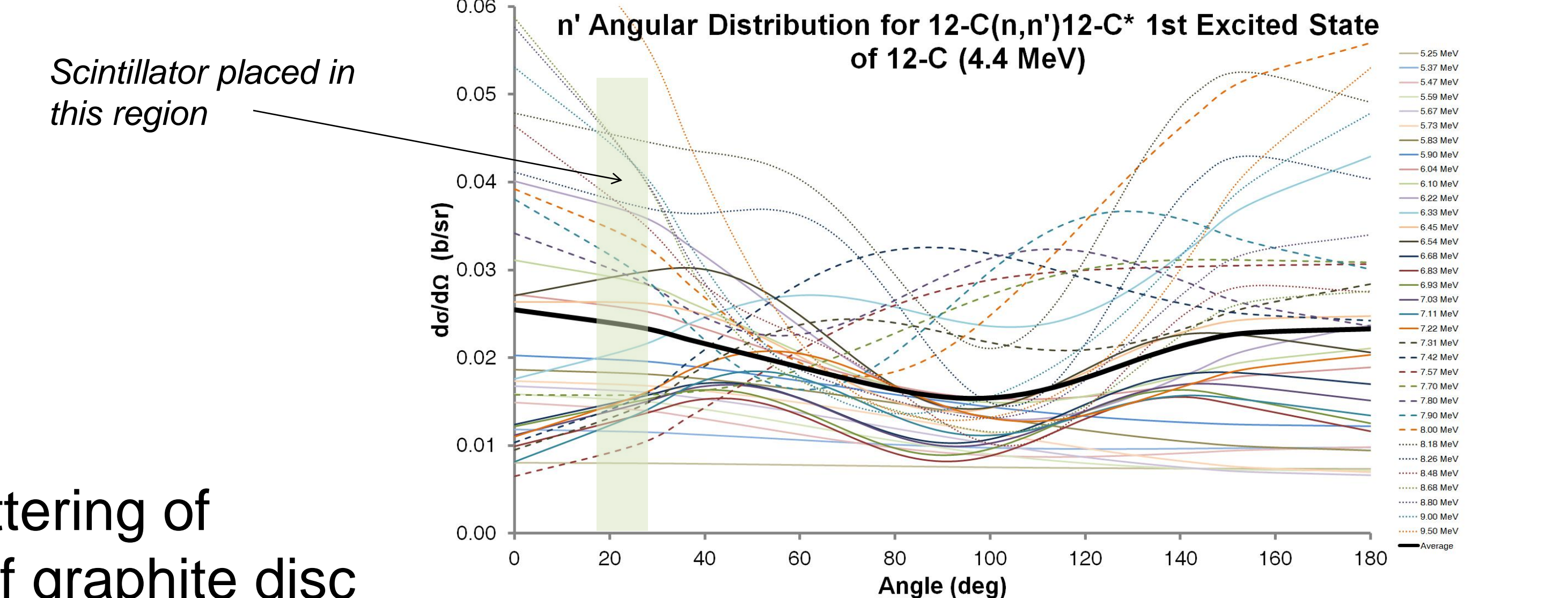


Future Experiments

- Time-of-Flight
- Neutron Activation
- Detector Calibrations



12-C(n, n')12-C*



Elastic scattering of neutrons off graphite disc



Coincidence plot of HPGe detector and scintillator with 3 ns timing window

