

# Correlated Gamma Neutron Energy measurements on Niobium

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Measurements of neutron inelastic cross sections on niobium are needed for improvement of nuclear reaction modeling for stockpile stewardship, magnetic confinement fusion, and space exploration. The Gamma Energy Neutron Energy Spectrometer for Inelastic Scattering (GENESIS), located at the 88 Inch Cyclotron at Lawrence Berkeley National Lab, is the first facility that allows experiments which measure correlated high-resolution gamma and outgoing neutron energy spectra using a modular combination of organic scintillators and high-purity germanium detectors. An experiment was performed with a naturally mono-isotopic  $^{93}\text{Nb}$  target with the GENESIS array. The 88-inch Cyclotron provided a pulsed neutron source via the thick target deuteron breakup mechanism using 25 MeV deuterons on a thick carbon target. The incident neutron energy for an event observed in the array is determined using time of flight. The pulse period of the beam leads to multiple energies being associated with each pulse due to frame overlap. Modeling will be performed where physical parameters including nuclear level density, photon strength and optical model parameters are adjusted until they optimally reproduce the gamma-ray and neutron spectra observed in the array addressing the ambiguity due to frame overlap. This presentation will present preliminary results and planned improvements of the GENESIS array.

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