## Recent Results from CoGNAC Neutron Scattering Measurements at LANL

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As the leading contributor to the total neutron cross section of nearly every nucleus, neutron scattering nuclear data are relevant for a wide variety of fundamental and applied fields of physics. While heavy element and actinide scattering cross sections are particularly poorly known, there exist major gaps in our understanding of cross sections and both neutron and  $\gamma$ -ray angular distributions from scattering reactions with no measurements of correlated n- $\gamma$  distributions on any nucleus except <sup>12</sup>C. Elements in structural materials, such as Al and Fe, and those that commonly appear in compounds, like C and O, are of particular importance for active interrogation scenarios, nuclear reactor studies, and more.

A new detector system for measuring neutron elastic and inelastic scattering cross sections termed the Correlated Gamma Neutron Array for sCattering (CoGNAC) is being developed for use at the fast, white neutron source at the Weapons Neutron Research (WNR) facility, which is part of the Los Alamos Neutron Science Center (LANSCE). This array utilizes a combination of liquid scintillator and C<sup>6</sup>LYC detectors to measure  $n-\gamma$  data from reactions on nuclei ranging from light elements up through actinides. In this talk, the analysis and covariance techniques developed for use on CoGNAC data will be discussed in the context of recent results for neutron scattering cross sections and angular distributions on C, O, Al, and Fe targets.

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Track Classification: Recent Experimental Results of Elastic and Inelastic Neutron Scattering