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Examining and Modeling Gamma Emission from Quasi-Differential High Energy Scattering Measurements

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Quasi-differential neutron measurements performed at Rensselaer Polytechnic Institute with the high-energy scattering (HES) system have been used to collect energy-angle information from samples-of-interest. Data from those measurements were used with MCNP to validate various evaluated nuclear data libraries, such as ENDF/B-VIII.0 and JENDL-5. In addition to total quasi-differential measurements methods were developed to isolate the contribution from elastic scattering, inelastic scattering, and fission based on the HES system's response to neutrons. To further expand the HES system's capabilities the gamma-ray response was modeled by coupling MCNP calculations with analytical methods. Data presented walkthrough initial steps to fully utilize all data collected during a quasi-differential scattering measurement.

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