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Absolute calibration of a cold and thermal neutron detector using monochromatic neutron beam[1] JIN HA CHOI, CHRISTOPHER CUDE-WOODS, North Carolina State University, TAKEYASU ITO, Los Alamos National Laboratory, ALBERT YOUNG, North Carolina State University — Time of flight spectra for cold neutrons exiting the moderator volume of the LANSCE UCN source has been obtained using a commercial neutron scintillator, EJ-426, coupled to a Hamamatsu R1355. The absolute efficiency for this detector system was determined using a 37.4 meV (monochromatic) neutron beam from the Neutron Powder Diffraction Facility (NPDF) at North Carolina State University's PULSTAR reactor. We measured the absolute neutron flux at the NPDF through thin foil activation and explored threshold effects through analysis of the measured pulse height distribution for effectively pure neutron signals from the NPDF beam. Non-uniformity of the flux profile across the detector and the detection efficiency as a function of the point of incidence of neutrons on the scintillator was explored using a X-Y translation system to perform scans using either fixed or movable apertures. The results are generally consistent with our expectations for this system, and provide a quantitative assessment of the sensitivity of this system to cold and thermal neutrons.

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