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Calibration of a cadmium capture-gated neutron spectrometer CRAIG HIGGINS, KENT TALBERT, LAWRENCE REES, J. BART CZIRR, JOHN ELLSWORTH, Brigham Young University — The cadmium capture-gated neutron spectrometer utilizes a dual-pulse signal from incoming neutrons to differentiate between neutrons and gamma rays. We have built such a detector and performed a time-of-flight experiment at Ohio University to measure incident neutron energy. We determined the detector efficiency as a function of neutron energy for neutrons with energies 0.5 MeV - 9 MeV. The detector has a peak efficiency of 12% for 2 MeV neutrons. The cadmium capture of the neutrons provides a low energy neutron detection boost that keeps the efficiency above 9% for neutrons with energy less than 2 MeV. A properly calibrated cadmium-capture gated neutron detector can be used to measure low energy neutrons from fission sources.

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