

Abstract Submitted
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Precision Measurement of $^{56}\text{Fe}(\text{n},\text{n}\gamma)$ Cross Sections Using 14.1 MeV Neutrons¹ HAOYU WANG, DAVID KOLTICK, Purdue University — Integral production cross sections for 846.8 keV and 1238.3 keV prompt gamma rays from 14.1 MeV neutrons interactions on ^{56}Fe are reported. The experimental technique takes advantage of the 1.5 nanosecond coincidence timing resolution between the neutron production time and the gamma ray detection time to reject noise, together with the large 30% solid angle gamma ray coverage. The scattering angle coverage with respect to the neutron beam direction extends from 60 degrees to 120 degrees. The neutron flux is measured using the detected associated alpha-particle from the D-T fusion reaction produced using an associated particle neutron generator. Present cross section measurements using other techniques with limited timing resolution and solid angle coverage are in agreement at neutron energies lower than 6 MeV. At higher neutron energies reported results can disagree by more than 20%. The more accurate technique used in these measurements can distinguish between the differences in the present reported results at higher neutron energies.

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