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**Measurement of the $^{242}$Pu neutron capture cross section**[1] M.Q. BUCKNER, C.Y. WU, R.A. HENDERSON, B. BUCHER, Lawrence Livermore National Laboratory, T.A. BREDEWEG, B. BARAMSAI, A. COUTURE, M. JANDEL, S. MOSBY, J.M. O'DONNELL, J.L. ULLMANN, Los Alamos National Laboratory, A. CHYZH, North Carolina State University, DANCE COLLABORATION
— Precision (n,f) and (n,$\gamma$) cross sections are important for the network calculations of the radiochemical diagnostic chain for the U.S. DOE's Stockpile Stewardship Program. $^{242}$Pu(n,$\gamma$) cross section is relevant to the network calculations of Pu and Am. Additionally, new reactor concepts have catalyzed considerable interest in the measurement of improved cross sections for neutron-induced reactions on key actinides. To date, little or no experimental data has been reported on $^{242}$Pu(n,$\gamma$) for incident neutron energy below 50 keV. A new measurement of the $^{242}$Pu(n,$\gamma$) reaction was performed with the DANCE together with an improved PPAC for fission-fragment detection at LANSCE during FY14. The relative scale of the $^{242}$Pu(n,$\gamma$) cross section spans four orders of magnitude for incident neutron energies from thermal to $\approx$ 30 keV. The absolute scale of the $^{242}$Pu(n,$\gamma$) cross section is set according to the measured $^{239}$Pu(n,f) resonance at 7.8 eV; the target was spiked with $^{239}$Pu for this measurement. The absolute $^{242}$Pu(n,$\gamma$) neutron capture cross section is $\approx$ 30% higher than the cross section reported in ENDF for the 2.7 eV resonance. Latest results to be reported.

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