

Abstract Submitted  
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**Advances in  $^{239}\text{Pu}(n,f)$  Prompt Fission Neutron Spectrum Measurements from the Chi-Nu Experiment** KEEGAN KELLY, MATTHEW DEVLIN, JOHN O'DONNELL, DENISE NEUDECKER, ROBERT HAIGHT, JAIME GOMEZ, TERRY TADDEUCCI, Los Alamos National Laboratory, CHING-YEN WU, ROGER HENDERSON, JACK HENDERSON, Lawrence Livermore National Laboratory, AMY LOVELL, NIKOLAS FOTIADES, JOHN ULLMANN, TOSHIHIKO KAWANO, SHEA MOSBY, MORGAN WHITE, HYE YOUNG LEE, PATRICK TALOU, Los Alamos National Laboratory — The prompt fission neutron spectrum (PFNS) is of vital importance for understanding the behavior of systems driven by neutron-induced fission. The  $^{239}\text{Pu}(n,f)$  PFNS was recently measured at LANL with the Chi-Nu experimental approach in which results from a Li-glass and from a liquid scintillator array were combined to form a single measurement from 10 keV to 10 MeV outgoing neutron energy for each of 20 incident neutron energy ranges from 1-20 MeV. Data analysis incorporated a highly-detailed covariance assessment, including correlations between all 1300 reported PFNS data points. These correlations allowed for the determination of the covariance matrix of the mean spectrum energies as a function incident neutron energy, which had never before been reported for an experimental PFNS measurement. Clear observations of second-chance fission and pre-equilibrium neutron emission was observed, though third-chance fission is much less prominent than predicted in ENDF/B-VIII.0 and other evaluations.

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