

Abstract Submitted  
for the DNP20 Meeting of  
The American Physical Society

**Fission product-yield measurements of importance to the bump in the reactor antineutrino energy spectrum** SEAN FINCH, WERNER TORNOW, CALVIN HOWELL, FNU KRISHICHAYAN, Duke University, TODD BREDEWEG, MATTHEW GOODEN, DAVID VIEIRA, JERRY WILHELMY, Los Alamos National Laboratory, ANTHONY RAMIREZ, JACK SILANO, MARK STOYER, ANTON TONCHEV, Lawrence Livermore National Laboratory — Using the rapid belt-driven irradiated target transfer system (RABITTS), cyclic activation was performed to measure cumulative fission yields for products with half-lives between 0.5 s and 50 s. Fission was induced on  $^{238}\text{U}$  using 2 MeV neutrons, and the resultant products were identified and quantified with  $\gamma$ -ray spectroscopy using HPGe detectors. Emphasis was placed on fission products which are known to contribute to the antineutrino energy spectrum in the 5 to 6 MeV energy range [1-3]. This region of the reactor antineutrino spectrum is commonly referred to as the “bump,” and is one component of the reactor antineutrino anomaly. In contrast to research reactors using highly enriched  $^{235}\text{U}$ ,  $^{238}\text{U}$  is expected to contribute significantly to the antineutrino spectrum at the power reactors Daya Bay, RENO, and Double Chooz. Preliminary results will be presented for the most important fission products of interest, in addition to other short-lived fission products. [1] D.A. Dwyer and T.J. Langford, Phys. Rev. Lett. 114, 012502 (2015). [2] A.A. Sonzogni, T.D. Johnson, and E.A. McCutchan, Phys. Rev. C 91, 011301(R) (2015). [3] A.C. Hayes et al., Phys. Rev. D 92, 033015 (2015).

Sean Finch  
Duke University

Date submitted: 25 Jun 2020

Electronic form version 1.4