Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Modernizing the Fission Basis[1] ANTON TONCHEV, ROGER HENDERSON, NICOLAS SCHUNCK, MARK SROYER, RAMONA VOGT, Lawrence Livermore Natl Lab — In 1939, Niels Bohr and John Wheeler formulated a theory of neutron-induced nuclear fission based on the hypothesis of the compound nucleus [1]. Their theory, the so-called "Bohr hypothesis," is still at the heart of every theoretical fission model today and states that the decay of a compound nucleus for a given excitation energy, spin, and parity is independent of its formation [2]. We propose the first experiment to validate to 1-2% absolute uncertainties the practical consequences of the Bohr hypothesis during induced nuclear fission. We will compare the fission product yields (FPYs) of the same ^{240}Pu compound nucleus produced via two different reactions (i) n+^{239}Pu [3] and (ii) γ+^{240}Pu. These high-precision FPYs measurements will be extremely beneficial for our fundamental understanding of the nuclear fission process and nuclear reactions from first principles. [1] N. Bohr and J. A. Wheeler, *Phys. Rev.* **56**, 426 (1939). [2] N. Bohr, *Nature.* **137**, 344 (1936). [3] M. E. Gooden et al. Nuclear Data Sheets **119,** 324 (2016).

[1]This work was performed under the auspices of US DOE by LLNL under contract DE-AC52-07NA27344. Funding was provided via the LDRD-ERD-069 project.

Anton Tonchev
Lawrence Livermore Natl Lab

Date submitted: 29 Jul 2016 Electronic form version 1.4