Abstract Submitted
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Connecting Nuclear Structure to Stellar Astrophysics: Neutron Skin in Tin Isotopes[1] JACK SILANO, A.P. TONCHEV, N. SCHUNCK, Lawrence Livermore National Laboratory, W. TORNOW, F. KRISHICHAYAN, S. FINCH, Duke University and TUNL, D. LITTLE, M. JONES, R. JANSSENS, UNC - Chapel Hill and TUNL, C. PRUITT, L. SOBOTKA, Washington University, St. Louis, A. BANU, James Madison University, J. VAVREK, MIT, N. TSONEVA, ELI-NP — The first observation of a neutron star merger by the LIGO-Virgo collaboration in 2017 highlights the need to improve our fundamental understanding of the equation of state (EOS) of dense, neutron rich matter. The origin of heavy elements in the r-process and the structure of neutron stars are governed by the properties of neutron rich matter, for which experimental data is limited. Further analysis of this historic event and all future neutron star mergers relies on constraining the nuclear EOS with experimental observables. We propose a novel method for systematically studying the evolution of the neutron skin in stable tin isotopes, by measuring the low-energy nuclear dipole strength over the broadest possible range of neutron-to-proton ratios in a single element. Nuclear resonance fluorescence with 100% linearly polarized photons from the High Intensity γ-ray Source facility will be used to selectively measure the E1 photoabsorption strength of ^{112}Sn and ^{124}Sn at excitation energies from $\sim$ 3 MeV up to neutron separation, where the Pygmy Dipole Resonance dominates. Progress on the measurement campaign will be presente

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