Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

First Constraints on the Nuclear Force at Neutron Star Densities JACKSON PYBUS, MIT, CLAS COLLABORATION — The strong nuclear interaction between nucleons is the fundamental quantity of nuclear physics. As it cannot easily be calculated directly from QCD, it is traditionally described using parameterized effective models. While these models are well-constrained at large distances by nucleon-nucleon (NN) scattering data, its short-distance behavior is largely unconstrained, limiting our ability to theoretically describe high-density nuclear systems such as neutron stars. In this talk I will present new measurements of Short-range correlated (SRC) nucleon pairs using exclusive (e,e'NN) reactions done using the CLAS spectrometer at the Thomas Jefferson National accelerator Facility (JLab). The new data covers nucleon momenta range of 400 to 1000 MeV/c and is analyzed using the new theoretical framework of the Generalized Contact Formalism (GCF). We find that the GCF provides good kinematic agreement with data of such SRC breakup events and shows high sensitivity to the short-distance behavior of the nucleon-nucleon (NN) interaction. The data is well described by the phenomenological AV18 interaction up to 1000 MeV/c. Local Chiral interactions are also observed to provide a good description of the data up to their momentum- or position-space cutoffs.

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Date submitted: 01 Jul 2019 Electronic form version 1.4