Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Precise Calibration of Laser Frequency for determination of Ni Charge Radius[1] ROBERT POWEL, National Superconducting Cyclotron Laboratory, MSU, East Lansing, MI 48824, USA, ANDREW KLOSE, Department of Chemistry, Augustana University, Sioux Falls, SD 57197, USA, DAVID GARAND, KRISTIAN KOENIG, JEREMY LANTIS, YUAN LIU, KEI MINIMISONO, SKYY PINEDA, National Superconducting Cyclotron Laboratory, MSU, East Lansing, MI 48824, USA — Collinear laser spectroscopy is commonly used to determine charge radii, and requires accurate and precise knowledge of the laser frequency to a level of roughly 1 MHz. A Doppler-free laser spectroscopic system has been implemented at the BECOLA facility to calibrate the laser frequency against precisely-known transitions in molecular iodine. After calibration, the laser system will be used to determine charge radius of ^{54}Ni, which is important to address the soft nature [1] of doubly-magic ^{56}Ni as well as to deduce the slope parameter, L, in the symmetry energy of the nuclear equation of state [2]. The performance characteristics of the laser frequency calibration system will be presented and the results will be discussed. [1] M. Honma et al., Phys. Rev. C 65, 061301 (2002). [2] B. A. Brown et al., Phys. Rev. Research 2, 022035 (R) (2020).

[1]This work was supported in part by NSF Grant NOs. PHY-15-65546 and PHY-19-13509, and U.S. DOE grant DE-NA0002924.

Robert Powel
National Superconducting Cyclotron Laboratory, MSU, East Lansing, MI 48824, USA

Date submitted: 24 Jun 2020 Electronic form version 1.4