Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Precise Calibration of Laser Frequency for determination Sc Charge Radii[1] R. POWEL, National Superconducting Cyclotron Lab., MSU, East Lansing, MI 48824, A. KLOSE, Dept. of Chemistry, Augustana Univ., Sioux Falls, SD 57197, USA, D. GARAND, J. D. LANTIS, A. J. MILLER, K. MINAMISONO, W. NAZAREWICZ, S. PINEDA, C. SUMITHRARACHCHI, National Superconducting Cyclotron Lab., MSU, East Lansing, MI 48824, J. KRAMER, W. NORTERSHAUSER, D. M. ROSSI, Technische Univ. Darmstadt, 64289 Darmstadt, Germany, Y. LIU, F. SOMMER, Physics Division, Oak Ridge National Lab., Oak Ridge, TN 37831, USA, M. PEARSON, TRIUMF, Vancouver, BC, Canada, P.-G. REINHARD, Institut fur Theoretische Physik II, Univ. Erlangen-Nurnberg, Erlangen, Germany — A kink structure is observed at the magic numbers in chains of charge radii but is missing at the neutron number $N = 20$ for $_{18}$Ar, $_{19}$K and $_{20}$Ca. Determination of the charge radii of proton-rich $_{21}$Sc isotopes across $N = 20$ are planned to address the disappearance of shell-closure signature. Collinear laser spectroscopy, which requires accurate and precise knowledge of laser frequency, will be used to deduce the charge radii. To calibrate the laser frequency, a Doppler-free spectroscopic measurement of molecular iodine is being implemented to measure precisely-known transitions in the visible to near-infrared wavelength region. The status of development and test results will be discussed.

[1]This work was supported in part by the National Science Foundation, Grant No. PHY-15-65546

Robert Powel
Michigan State Univ

Date submitted: 26 Jun 2019 Electronic form version 1.4