

## **COLLINEAR LASER SPECTROSCOPY FOR NUCLEAR STRUCTURE STUDIES AT NSCL<sup>#</sup>**

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The BEam COoler and LAsEr spectroscopy (BECOLA) facility at National Superconducting Cyclotron Laboratory (NSCL) at Michigan State University (MSU) is a collinear laser spectroscopy (CLS) facility. Nuclear ground and isomeric state properties such as mean squared charge radii and electromagnetic moments are determined to study evolution of nuclear structure across nucleon shell closures. BECOLA is used to perform both laser hyperfine structure measurements via CLS with bunched beams and atomic/nuclear spin manipulation using optical pumping and nuclear-magnetic resonance techniques ( $\beta$  NMR) for rare isotopes at low counting rates. BECOLA currently accepts a continuous  $\sim 30$  keV ion beam from the NSCL gas stopper, cools and bunches the ions, which are then collinearly propagated with laser light through the CLS beam line, where resonant-photon detection or optical pumping to produce polarization for  $\beta$ -decay asymmetry detection is performed. Recent results obtained at NSCL for CLS on neutron-deficient potassium and iron isotopes around  $N = 20$  and 28 neutron-shell closures, respectively, will be discussed, along with future prospects for BECOLA facility with the establishment of the Facility for Rare Isotope Beams (FRIB) at MSU.

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