

## An advanced ion guide for beam cooling and bunching for collinear laser spectroscopy of rare isotopes

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Collinear laser spectroscopy provides a means of determining nuclear magnetic dipole and electric quadrupole moments and mean square charge radii of rare isotopes through the measurement of hyperfine spectra. Measurements performed at projectile fragmentation facilities with gas stopping capability can complement the efforts of ISOL-based efforts. Collinear laser spectroscopy of rare isotopes requires efficient transport of pulsed beams with very low energy spread. To this end, a next generation beam cooler and buncher has been developed and commissioned at the NSCL to provide bunched, low energy spread ion beams for collinear laser spectroscopy of rare isotopes. The beam cooler and buncher features a novel electrode design intended to simplify construction and maintenance, as well as permit the use of large radiofrequency (RF) amplitudes for more efficient beam cooling, especially in the case of high beam currents. The cooler and buncher has been characterized with an offline ion source, and an online measurement of the hyperfine spectrum of the D1 transition of  $^{37}\text{K}$  has been performed. The results of commissioning measurements will be presented.