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Progress towards a "blue" potassium MOT DAVID MCKAY, DAN FINE, DYLAN JERVIS, GRAHAM EDGE, JOSEPH THYWISSEN, University of Toronto — One difficulty when preparing quantum degenerate gases of potassium 40 is the low efficiency of sub-Doppler cooling. In this talk, we discuss how we are attempting to circumvent this problem by implementing a "blue" MOT for ^{40}K on the non-cycling $4S_{1/2} \rightarrow 5P_{3/2}$ transition, which has a wavelength of 404.53nm and a decay rate of 1.17MHz. The Doppler temperature should be 27μK, which is a factor of five improvement over the D2 transition at 767nm. This lower temperature would also facilitate in-situ imaging of atoms in optical lattices. The laser setup consists of a cooled diode injection locked to an external cavity diode laser. The master laser is in turn locked to ^{39}K saturation spectroscopy in a heated vapor cell. The proximity of this 4S-5P transition to the wavelength used in "Blu-ray" technology provides a relatively inexpensive source of laser diodes with powers up to 150mW. A dual MOT will be implemented using dichroic mirrors and waveplates for loading and capture with 767nm, followed by a switch to a "blue" MOT for late-stage cooling before loading into a magnetic trap. We will also present results on the spectroscopy of the ^{40}K $5P_{3/2}$ hyperfine levels using our setup.

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