

Abstract Submitted
for the CUWIP22 Meeting of
The American Physical Society

Building Cesium Blue Magneto-Optical Trap¹ CHITOSE MARUKO, WILL WILLIAMS, Smith College — Magneto-optical traps (MOT) are apparatus to laser cool and spatially trap neutral atoms with scattering forces and a spatially varying magnetic field. It has a wide application in variety of AMO experiments such as ultracold atom experiments, optical lattice clocks, neutral atom quantum computing, etc. Our goal is to construct the world's first Cesium MOT with a blue cooling transition, $6S_{1/2}F = 4 \rightarrow 7S_{3/2}F = 5$, to make a visible optical cooling transition MOT available for undergraduate advanced laboratory classes. A Cesium MOT with this cooling transition has a loss channel due to occasional excitation of atoms to the $F = 4$ state and subsequent decay to the $F = 3$ ground state. We constructed an 852 nm tunable external cavity diode laser (ECDL) to drive the $6S_{1/2}F = 3 \rightarrow 6S_{3/2}F = 4$ transition. Using the constructed ECDL, we performed saturated absorption spectroscopy on the $6S_{1/2}F = 3 \rightarrow 6S_{3/2}F = 2, 3, 4$ transitions to frequency stabilize the laser to the repump transition.

¹NSF PHY-2110311

Chitose Maruko
Smith College

Date submitted: 06 Jan 2022

Electronic form version 1.4