Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

A high-power, narrow, blue continuous-wave laser by intracavity frequency doubling of a tapered amplifier laser LIN SU, MARK STONE, AZIZA SULEYMANZADE, DAVID SCHUSTER, JONATHAN SIMON, University of Chicago — High-power, narrow lasers at visible and UV wavelengths are essential for manipulating highly-excited atoms. We present progress toward a home-built laser at 481nm to drive the transition between the first excited state and Rydberg states of rubidium atoms. A self-seeded tapered amplifier laser first generates more than 2 Watts of light at 962 nm. Optical feedback is provided by a reflective volume Bragg grating with a narrow 23 GHz bandwidth, suppressing mode hopping. Then, a resonant build-up cavity housing a nonlinear MgO-doped PPSLT crystal is expected to frequency double with a design based on Koustubh Danekar, Ali Khademian, and David Shiner, "Blue laser via IR resonant doubling with 71% fiber to fiber efficiency," Opt. Lett. 36, 2940-2942 (2011). We hope to achieve blue power of nearly 2 Watts with a linewidth down to 10 kHz. All our techniques are highly-transferable to making low-cost lasers at other visible and UV frequencies.

Lin Su
University of Chicago

Date submitted: 01 Feb 2019 Electronic form version 1.4