

Abstract Submitted  
for the NWS12 Meeting of  
The American Physical Society

**Generation of coherent blue light in rubidium vapor: An advanced undergraduate laboratory** SHANNON MAYER, University of Portland, MARCUS KIENLEN, NOAH HOLTE, HUNTER DASSONVILLE, Pacific University, KURT IVERSEN, RYAN MCLAUGHLIN, University of Portland, ANDREW DAWES, Pacific University — We describe an experiment for generating and characterizing coherent blue light in a rubidium vapor using two grating-feedback diode lasers. The lasers, operating at 780.2 nm and 776.0 nm respectively, provide step-wise excitation from the 5S ground state to the 5D excited state in rubidium. Cascade decay through the 6P state can produce a coherent beam of light at 420 nm. In this experiment, carried out in two different laboratories with different equipment, we investigate the spatial coherence and spectral characteristics of the blue beam under a variety of experimental conditions. This experiment provides advanced undergraduate physics students with a unique opportunity to investigate nonlinear optical phenomena in the laboratory. The equipment is similar to that used for saturated absorption spectroscopy in rubidium and can therefore be easily performed in laboratories with apparatus for that experiment.

Shannon Mayer  
University of Portland

Date submitted: 18 Sep 2012

Electronic form version 1.4