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Rydberg excitation in Rb atoms using external cavity diode lasers[1] DONALD P. FAHEY, BONNIE L. SCHMITTBERGER, MICHAEL W. NOEL, Bryn Mawr College — Rubidium atoms were excited to Rydberg states by two different pathways using only external cavity diode lasers. In the first method we excited atoms from the 5S to 5P state with 780 nm light, and then from the 5P to 5D state with 776 nm light. Atoms fluoresce to the 6P state, where they are then excited to Rydberg states using a tunable diode laser with a center wavelength of 1015 nm. Although this method involves populating the 6P state through fluorescence from the 5D state, this did not appear to greatly hinder the pathway's efficiency in exciting Rydberg states. In the second method, pulsed 960 nm light from a diode laser was frequency doubled and used to excite Rydberg states directly from the 5P state. Measurement of Rydberg states using each method will be presented and details of the techniques discussed.

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