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**Construction and Analysis of an External Cavity Diode Laser with a Grating Mounted in Littrow** CLINT MIMS, ERIC GARDNER, CHARITY HAWKINS, R. SETH SMITH, Francis Marion University — Although unmodified diode lasers have some undesirable characteristics, they are still widely used because of their low cost and easy operation. In addition, they can be modified to improve their operation. In this experiment an external cavity was added to a diode laser by mounting a diffraction grating in a Littrow Configuration in order reduce the linewidth of the diode laser output. A thermoelectric cooler was used in order to control the temperature of the diode laser and a piezo electric crystal was added for tuning the wavelength of the diode laser. Tests were performed on the diode laser with and without the external cavity. The external cavity diode laser (ECDL) had a decreased bandwidth, fewer “mode” hops, and an increase in power.

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