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Some Investigations with Fiber Coupled Laser Diode Modules for Use in Precision Spectroscopy[1] ALI KHADEMIAN, KOUSTUBH DANEKAR, KRISTA JANSEN, DAVID SHINER, University of North Texas — Mass produced commercial fiber-coupled pump laser diodes are particularly attractive laser sources because of their relatively high power (200-500 mW) and low cost compared to other laser systems. We incorporate narrow bandwidth fiber Bragg gratings (FBG) to form an external cavity using these single-mode fiber-coupled pump lasers at 960-980 nm and 1420- 1500 nm. The lasers normally operate in many longitudinal modes. Under appropriate conditions single frequency operation results with small tuning about the FBG center wavelength. We also discuss our use of a common diode laser model that characterizes the laser operation, along with some simple measurements to help fix the model parameters. In our particular application (1S to 2S transition in the atomic hydrogen isotopes), we need an ultra violet 243 nm laser source. Frequency doubling of a stabilized laser at 972 nm can be achieved using nonlinear crystals. Results of employing PPLN and PPKTP waveguides and PPKTP in a self contained resonant build-up cavity to generate blue laser at 486 nm are presented.

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