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Line Narrowing of a Broad Area Laser Diode JERRY SELL, WOODDY MILLER, DALLAS WRIGHT, BORIS ZHDANOV, RANDY KNIZE, United States Air Force Academy — An external cavity for a broad area laser diode will be presented which significantly narrows the spectral bandwidth. Broad area laser (BAL) diodes are relatively low cost while achieving high output powers with a compact and efficient design. However, they generally have poor spatial characteristics and a typical linewidth of several nanometers. In order to make BAL diodes useful for such applications as spin-exchange optical pumping, laser spectroscopy, and nonlinear optics, a narrow linewidth is crucial. Previously we reported on a narrowband external cavity laser diode array[1], which achieved a linewidth of 11 GHz and an operating power of approximately 10 W at 852 nm, making it very useful for cesium vapor laser pumping. We will present our most recent results of further line narrowing (MHz's) using a high power (30 W) single emitter broad area laser diode.

[1]B.V. Zhdanov, T. Ehrenreich, and R.J. Knize, Elec. Lett. **43** (4), 221 (2007).

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