

## FIBER BRAGG GRATINGS EXTERNAL CAVITY LASERS AND APPLICATIONS

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**ABSTRACT:** Numerical simulations based on a multimode rate-equation model used to study the effect of fiber Bragg grating (FBG) external cavity reflectors on the performance of multimode semiconductor lasers. The factors affecting the relative noise and the wavelength stable range are discussed. Design principles for the selection of semiconductor lasers with (FBG) external cavity reflectors are given based on the numerical results. Fiber Bragg grating laser technology has been refined to produce low threshold, high-power and narrow-linewidth devices (distributed feedback lasers) for a large number of applications such as wavelength division multiplexing (WDM) communication systems, optical fiber sensors, spectroscopy, and active laser radars. Fiber Bragg gratings have a number of important applications in this optical device.

**KEYWORDS:** fiber Bragg grating laser, relative intensity, noise, spontaneous noise