Abstracts

Studies of Semiconductor Lasers of the Interferometric and Ring Types

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In this paper we present an analysis of semiconductor lasers of the interferometric and ring types, using the scattering-matrix formulation. The purpose of our analysis is to find new applications for semiconductor lasers beyond serving merely as a source for coherent radiation. Potential applications include wavelength stability, possibility for wavelength tuning and switching, operation as a traveling wave laser, and possible reduction in feedback effect. An initial set of experiments has been carried out and the results have borne out some theoretical predictions. These lasers should offer promises for use in integrated optics and fiber optical communication. Furthermore, the scattering-matrix formulation should be useful in treating other complex laser structures and lasers in an optical network environment.

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