

عنوان مقاله:

Vertical Cavity Surface Emitting Lasers using accurate numerical methods and non-uniform meshes

محل انتشار:

سومین کنفرانس بین المللی پژوهش در علوم و مهندسی (سال: 1396)

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نویسنده:

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خلاصه مقاله:

This paper gives you guidelines of Vertical Cavity Surface Emitting Lasers performs electrical, thermal, and optical simulation of vertical cavity surface emitting lasers using accurate, robust, and reliable fully numerical methods and non-uniform meshes. VCSEL works with Blaze and Giga and in the end we can test whether the structure complies to general VCSEL device requirements by simulating cold cavity reflectivity experiments. Calculate the reflectivity of a VCSEL cavity as a function of the incident light wavelength in a user-specified range. Then, determine the resonant frequency of the cold cavity. Solve the Helmholtz equation in cylindrical coordinates to calculate optical intensities of the multiple transverse modes for index guiding and gain guiding structures. Calculate the optical gain in multiple quantum well systems depending on the photon energies, quasi-Fermi levels, temperature, and optical intensity distribution. Calculate the carrier recombination due to the spontaneous and stimulated emission. Solve the photon rate equations Photon Rate Equations for multiple transverse modes to calculate the photon density in each mode and the total photon density, Speed up solution of the Helmholtz equation by using perturbational treatment

کلمات کلیدی:

VCSEL, Helmholtz equation, Photon Rate, optical electric field

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