

Spatial Hole Burning and Current Self-Distribution in Vertical-Cavity Surface-Emitting Lasers

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A three-dimensional electrical-thermal-optical numerical solver is applied to model top-emitting oxide-confined vertical-cavity surface-emitting lasers (VCSELs) with GaAs/AlGaAs multiple-quantum-well active region. CW mode of operation is simulated over a range of voltages, covering sub-threshold spontaneous emission and lasing emission. Effect of spatial hole burning and self-distribution of electrical current in oxide-confined VCSELs are demonstrated in a self-consistent electrical-thermal-optical simulation.