Abstracts

An Extended Complex Finite Difference Method for the Analysis of Semiconductor Lasers with Electrode Discontinuities

S. Chen and R. Vahldieck. "An Extended Complex Finite Difference Method for the Analysis of Semiconductor Lasers with Electrode Discontinuities." 1995 MTT-S International Microwave Symposium Digest 95.2 (1995 Vol. II [MWSYM]): 805-808.

The complex finite difference method is extended to form a self-consistent 3-D analysis tool for gain- and index- guided semiconductor lasers. Single- and double-strip laser diodes with and without strip discontinuities (to accommodate the bias current contact pad) are investigated by directly discretizing the 3-D Laplace equation, the 2-D carrier rate equation and the scalar wave equation. In combination with the Rayleigh variational principle, the complex propagation constant of the first two lowest order laser modes can be calculated as well as the complex refractive index distribution in the active layer.

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