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Coupled-wave model for square-lattice photonic-crystal lasers with TE polarization -- a general approach

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A general coupled-wave model is presented for square-lattice photonic crystal (PC) lasers with transverse-electric polarization. This model incorporates the high-order coupling effects that are important for two-dimensional PC laser cavities and gives a general and rigorous coupled-wave formulation for the full three-dimensional structures of typical laser devices. Numerical examples based on our model are presented for PC structures with different air-hole shapes. The accuracy of the results obtained is verified using three-dimensional finite-difference time-domain simulations.

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