Abstracts

Statistical Coupled Equations in Lossless Optical Fibers

The problem of deriving sets of statistical coupled equations for the second and fourth moments of the mode amplitudes in a fiber with mode coupling is considered, starting from the deterministic coupled wave equations describing an electromagnetic field propagating in a lossless fiber. Our results extend the work of Marcuse, and, in particular, allow one to deduce sets of equations for quantities which describe the cross correlation between different modes. Furthermore, we obtain new results regarding the variances and cross correlations of the power in the modes (fourth-order amplitude statistics)

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