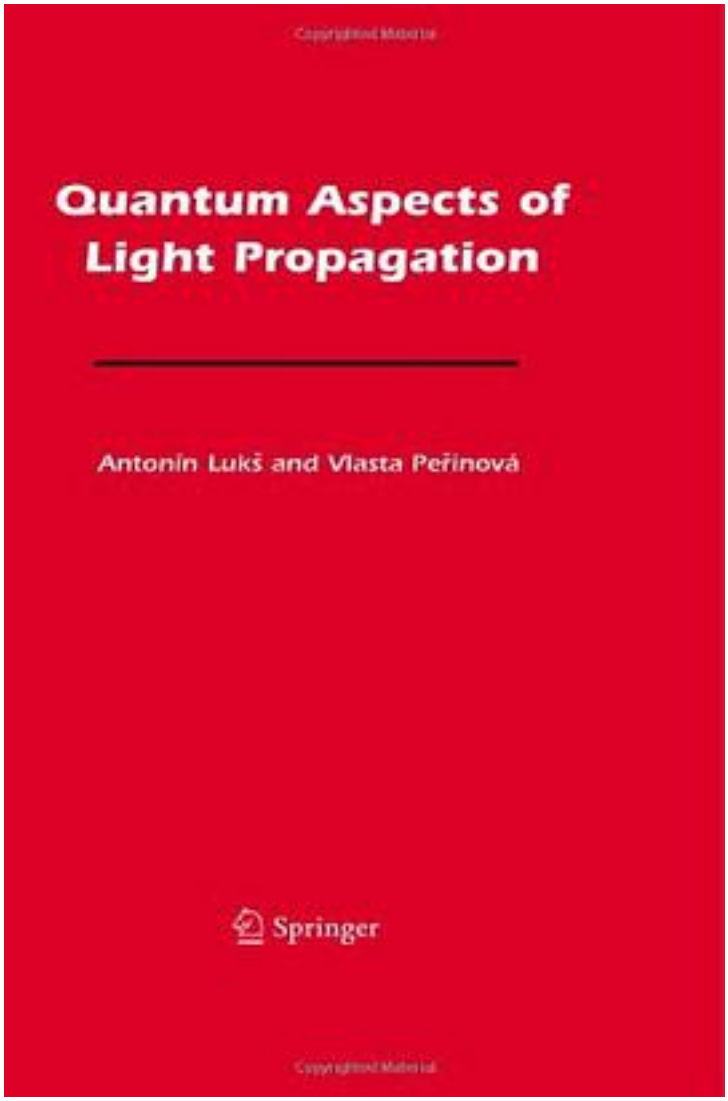
Quantum Aspects of Light Propagation



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Quantum Aspects of Light Propagation provides an overview of spatio-temporal descriptions of the electromagnetic field in linear and nonlinear dielectric media, appropriate to macroscopic and microscopic theories. Readers will find an introduction to canonical quantum descriptions of light propagation in a nonlinear dispersionless dielectric medium, and an approach to linear and nonlinear dispersive dielectric media. Illustrated by optical processes, these descriptions are simplified by a transition to one-dimensional propagation. Quantum theories of light propagation in optical media are generalized from dielectric media to magnetodielectrics, in addition to a presentation of classical and nonclassical properties of radiation propagating through negative-index media. Valuable analyses of quantization in waveguides, photonic crystals, and propagation in strongly scattering media are also included, along with various optical resonator properties. The theories are utilized for the quantum electrodynamical effects to be determined in periodic dielectric structures which are known to be a basis of new schemes for lasing and a control of light field state. Quantum Aspects of Light Propagation is a valuable reference for researchers and engineers involved with general optics, quantum optics and electronics, nonlinear optics, and photonics.

作者介绍:

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