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Characteristics of LP Modes; 3.4.3. Propagating Power of LP Modes; 3.5. FUNDAMENTAL HE₁₁ MODE; 3.6. DISPERSION CHARACTERISTICS OF STEP-INDEX FIBERS; 3.6.1. Signal Distortion Caused by Group Velocity Dispersion; 3.6.2. Mechanisms Causing Dispersion; 3.6.3. Derivation of Delay-time Formula; 3.6.4. Chromatic Dispersion; 3.6.5. Zero-dispersion Wavelength; 3.7. WAVE THEORY OF GRADED-INDEX FIBERS; 3.7.1. Basic Equations and Mode Concepts in Graded-index Fibers; 3.7.2. Analysis of Graded-index Fibers by the WKB Method 3.7.3. Dispersion Characteristics of Graded-index Fibers 3.8. RELATION BETWEEN DISPERSION AND TRANSMISSION CAPACITY; 3.8.1. Multimode Fiber; 3.8.2. Single-mode Fiber; 3.9. BIREFRINGENT OPTICAL FIBERS; 3.9.1. Two Orthogonally-polarized Modes in Nominally Single-mode Fibers; 3.9.2. Derivation of Basic Equations; 3.9.3. Elliptical-core Fibers; 3.9.4. Modal Birefringence; 3.9.5. Polarization Mode Dispersion; 3.10. DISPERSION CONTROL IN SINGLE-MODE OPTICAL FIBERS; 3.10.1. Dispersion Compensating Fibers; 3.10.2. Dispersion-shifted Fibers; 3.10.3. Dispersion Flattened Fibers 3.10.4. Broadly Dispersion Compensating Fibers 3.11. PHOTONIC CRYSTAL FIBERS; Appendix 3A Vector wave equations in graded-index fibers; Appendix 3B Derivation of equation (3.219); Chapter 3 REFERENCES; 4 Coupled Mode Theory; 4.1. DERIVATION OF COUPLED MODE EQUATIONS BASED ON PERTURBATION THEORY; 4.2. CODIRECTIONAL COUPLERS; 4.3. CONTRADIRECTIONAL COUPLING IN CORRUGATED WAVEGUIDES; 4.3.1. Transmission and Reflection Characteristics in Uniform Gratings; 4.3.2. Phase-shift Grating; 4.4. DERIVATION OF COUPLING COEFFICIENTS; 4.4.1. Coupling Coefficients for Slab Waveguides 4.4.2. Coupling Coefficients for Rectangular Waveguides

Sommario/riassunto

Fundamentals of Optical Waveguides is an essential resource for any researcher, professional or student involved in optics and communications engineering. Any reader interested in designing or actively working with optical devices must have a firm grasp of the principles of lightwave propagation. Katsunari Okamoto has presented this difficult technology clearly and concisely with several illustrations and equations. Optical theory encompassed in this reference includes coupled mode theory, nonlinear optical effects, finite element method, beam propagation method, staircase concatenation

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