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2.2 Theoretical Approaches to Calculating Absorption and Gain in Quantum Dots2.3 Kinetic Theory of Quantum Dots; 2.4 Light-Matter Interactions in Quantum Dots; 2.5 The Nonlinearity Coefficient; 3 Quantum Dots in Amplifiers of Ultrashort Pulses; 3.1 Optical Amplifiers for High-Speed Applications: Requirements and Problems; 3.2 Quantum Dot Optical Amplifiers: Short-Pulse Operating Regime; 3.3 Quantum Dot Optical Amplifiers at High Bit Rates: Low Distortions and Patterning-Free Operation; 3.4 Nonlinear Operation and Limiting Function Using QD Optical Amplifiers; 4 Quantum Dot Saturable Absorbers
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5.4.2 Traveling Wave Modeling of Quantum Dot Mode-Locked Lasers: Effects of Multiple Levels and Inhomogeneous Broadening
5.4.3 Modal Analysis for QD Mode-Locked Lasers

Sommario/riassunto

In this monograph, the authors address the physics and engineering together with the latest achievements of efficient and compact ultrafast lasers based on novel quantum-dot structures and devices. Their approach encompasses a broad range of laser systems, while taking into consideration not only the physical and experimental aspects but also the much needed modeling tools, thus providing a holistic understanding of this hot topic.