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Sections; 3.6 Pump-Dump Control: Few Level Excitation; 3.A Appendix: Mode-Selective Chemistry; Chapter 4: Control of Intramolecular Dynamics; 4.1 Intramolecular Dynamics; Chapter 5: Optimal Control Theory; 5.1 Pump-Dump Excitation with Many Levels: the Tannor-Rice Scheme; 5.2 Optimal Control Theory; Chapter 6: Decoherence and Its Effects on Control; 6.1 Decoherence; 6.2 Sample Computational Results on Decoherence; 6.3 Environmental Effects on Control: Some Theorems; 6.4 Decoherence and Control
 6.5 Countering Partially Coherent Laser Effects in Pump-Dump Control
 6.6 Countering CW Laser Jitter; Chapter 7: Case Studies in Coherent Control; 7.1 Two-Photon vs. Two-Photon Control; 7.2 Control over the Refractive Index; 7.3 The Molecular Phase in the Presence of Resonances; 7.4 Control of Chaotic Dynamics; Chapter 8: Coherent Control of Bimolecular Processes; 8.1 Fixed Energy Scattering: Entangled Initial States; 8.2 Time Domain: Fast Timed Collisions; Chapter 9: The Interaction of Light with Matter: a Closer Look; 9.1 Classical Electrodynamics of a Pulse of Light
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 Chapter 10: Coherent Control with Quantum Light; 10.1 The Quantization of the Electromagnetic Field; 10.2 Quantum Light and Quantum Interference; 10.3 Quantum Field Control of Entanglement; 10.4 Control of Entanglement in Quantum Field Chiral Separation; Chapter 11: Coherent Control beyond the Weak-Field Regime: Bound States and Resonances; 11.1 Adiabatic Population Transfer; 11.2 An Analytic Solution of the Nondegenerate Quantum Control Problem; 11.3 The Degenerate Quantum Control Problem
 11.4 Adiabatic Encoding and Decoding of Quantum Information
 11.5 Multistate Piecewise Adiabatic Passage; 11.6 Electromagnetically Induced Transparency; Chapter 12: Photodissociation Beyond the Weak-Field Regime; 12.1 One-Photon Dissociation with Laser Pulses; 12.2 Computational Examples; Chapter 13: Coherent Control Beyond the Weak-Field Regime: the Continuum; 13.1 Control over Population Transfer to the Continuum by Two-Photon Processes; 13.2 Pulsed Incoherent Interference Control; 13.3 Resonantly Enhanced Photoassociation; 13.4 Laser Catalysis
 Chapter 14: Coherent Control of the Synthesis and Purification of Chiral Molecules

Sommario/riassunto

Written by two of the world's leading researchers in the field, this is a systematic introduction to the fundamental principles of coherent control, and to the underlying physics and chemistry. This fully updated second edition is enhanced by 80% and covers the latest techniques and applications, including nanostructures, attosecond processes, optical control of chirality, and weak and strong field quantum control. Developments and challenges in decoherence-sensitive condensed phase control as well as in bimolecular control are clearly described. Indispensable for atomic, molecular and c