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Nota di contenuto	Preface; CONTENTS; 1. Vibrational and Electronic Wavepackets Driven by Strong Field Multiphoton Ionization; 1.1 Introduction; 1.2 Theoretical Concepts; 1.2.1 The time-independent Schrodinger equation and its implications on dynamics; 1.2.2 Spin-orbit coupling and diabatic vs. adiabatic states; 1.2.3 Nuclear time-dependent Schrodinger equation; 1.2.3.1 Second-order differentiator; 1.2.3.2 Split-operator method; 1.2.4 Stark shifts; 1.2.5 Multi- vs. single-photon transitions; 1.2.6 Laser-dressed states; 1.2.7 Photon locking; 1.2.8 Hole burning; 1.2.9 Strong-field ionization 1.3 Computational and experimental details 1.4 Vibrational Wavepackets Created by Multiphoton Ionization; 1.4.1 Phase-dependent dissociation; 1.4.1.1 Photon locking; 1.4.1.2 Hole burning; 1.4.2 Ionization to different ionic states; 1.4.2.1 Preparing electronic

wavepackets via SFI; 1.4.2.2 VMI measurements to identify dissociation pathways following SFI; 1.5 Conclusion and Outlook; References; 2. Orientation-Selective Molecular Tunneling Ionization by Phase-Controlled Laser Fields; 1 Introduction; 2 Photoionization Induced by Intense Laser Fields; 2.1 MPI in standard perturbation theory 2.2 Keldysh theory: From MPI to TI 2.3 Characteristics of TI; 2.4 Molecular TI; 3 Directionally Asymmetric TI Induced by Phase-controlled Laser Fields; 3.1 Phase-controlled laser fields; 3.2 Directionally asymmetric TI (atoms); 3.3 Directionally asymmetric TI (molecules); 4 Experimental; 5 Results and Discussion; 5.1 Diatomic molecule: CO; 5.1.1 Photo fragment detection; 5.1.2 Photoelectron detection; 5.2 Other molecules; 5.2.1 Nonpolar molecule with asymmetric structure: Br(CH₂)₂ Cl; 5.2.2 Large molecule: C₆H₁₃I; 5.2.3 Systematically changing molecular system: CH₃X(X=F,Cl,Br, I) 5.2.4 OCS molecule investigated by nanosecond + 2 laser fields 6 Summary; Acknowledgments; References; 3. Reaction and Ionization of Polyatomic Molecules Induced by Intense Laser Pulses; 1.1 Introduction; 1.2 Ionization Rate of Molecules in Intense Laser Fields; 1.2.1 Theoretical approaches for ionization rates of molecules in intense laser fields; 1.2.2 Experimental measurements of ionization rates of molecules and comparisons with theory; 1.3 Fragmentation of Molecules in Intense Laser Fields 1.3.1 Ionization-dissociation of molecules in intense laser fields and statistical theoretical description 1.3.2 Effects of cation absorption on molecular dissociation; 1.4 Dissociative Ionization and Coulombic Explosion of Molecules in Intense Laser Fields; 1.4.1 Dissociative ionization of formic acid molecules; 1.4.2 Coulombic explosion of CH₃I; 1.5 Summary and Perspectives; Acknowledgments; References; 4. Ultrafast Internal Conversion of Pyrazine Via Conical Intersection; 1.1 Introduction; 1.2 Pyrazine: Ultrafast S₂(1B_{2u}, *) - S₁(1B_{3u}, n*) Internal Conversion Via Conical Intersection 1.3 Sub-20 fs Deep UV Laser for TRPEI of Pyrazine

Sommario/riassunto

This volume presents recent progress and perspectives in multi-photon processes and spectroscopy of atoms, ions, molecules and solids. The subjects in the series cover the experimental and theoretical investigations in the interdisciplinary research fields of natural science including chemistry, physics, bioscience and material science. This volume is the latest volume in a series that is a pioneer in compiling review articles of nonlinear interactions of photons and matter. It has made an essential contribution to the development and promotion of the related research fields. In view of the ra
