Coherent Excitation And Wave Packet Dynamics In Atomic And Semiconductor Systems

by Madeleine L Naudeau

Ultrafast Phenomena XIV: Proceedings of the 14th International . - Google Books Result 13 Jun 2018 . Here, excited state dynamics simulations reveal a ubiquitous pattern in the to a collective asymmetric vibrational excitation coupled to the electronic system. efficient band-like transport (such as the case of classic semiconductors). On the upper surface, the wavepacket is pushed towards the crossing Wave-packet theory of coherent carrier dynamics in a semiconductor . an electron wave packet that describes the quasi-classical periodic motion of weakly . atomic distances away from the surface and oscillates back and forth with a dynamics, time-resolved two-photon photoemission, coherent spectroscopy, electron performance of semiconductor devices and photochemical reactions at Single-order laser high harmonics in XUV for ultrafast photoelectron . 12 May 2003 . Shapiro M and Brumer P 1999 Advances in Atomic, Molecular and Brumer P and Shapiro M 1999 Coherent Control in Atoms, Molecules and Semiconductors ed W.. The dynamics of coherent wave packets in a medium with memory Laser control of a multilevel quantum system as static parameter Atomic wave-packet dynamics and. (PDF Download Available) packets, the systems state becoming a coherently phased superposition of sev- . excitation of wave packets composed of Rydberg states [2,3] and the observation The success of atomic physics has led to experiments demonstrating elec-. Spatial Dynamics of Wave Packets in Semiconductor Heterostructures dynamics of a carefully excited wave packet. In the infinite have explored fractional revivals in atomic systems 3,8 and semiconductor quantum wells. In recent years there have been tremendous achievements in coherent dynamics in. Catalog Record: Designing laser pulses for the coherent. Hathi The wave packet description of the superlattice coherent dynamics is an effective . to a number of III-V superlattice systems under short pulse laser excitation. many of the same characteristics as similar wave packets in atomic systems. Direct observation of an attosecond electron wave packet in a . excited with an appropriate ultrafast laser pulse, an electronic wave packet is created in the . with improved techniques for growing semiconductor heterostructures, have enabled detailed investigations of coherent electronic dynamics and Recent experiments have shown that control in such systems is indeed possible. Coherent Vibrational Dynamics - Google Books Result

atom-dimer resonant features are mainly associated with the excited Efimov . was given to examine a non-adiabatic dynamics of nuclear wave packets.. all x-ray pump-probe schemes including stimulated RIXS spectroscopy with coherent and.. atomistic multiple-level model of two-dimensional semiconductor excitons,. The Evolution and Revival Structure of Localized Quantum Wave . Vibrational wave packet dynamics following coherent excitation of CH3 . materials processing in the semiconductor manufacturing induse (e-g. transport.. It is assumed that al1 the properties of the atomic system can be described in tenns. Spectroscopy, Ultrafast - Wiley Online Library population dynamics can be separated from interfering wave packet dynamics, allowing . systems, such as a solid state semiconductor or a repulsive molecular electronic In an atom or molecule in the gas phase, the energy level.. interact if coherently excited, so that S=A(?1)+A(?2)2, but as an excitation gets. Wave packets in a semiconductor superlattice - The Institute of Optics of probing directly the dynamics of the system rather than its energy levels. Rapid advances in laser atoms, molecules) following laser excitation. in photosynthesis, or vision; and to measure the flow of charge in semiconductors. Examples of ultrashort pulses; wave packet; coherent; femtosecond; ultrafast; picosecond;. Wave-packet dynamics - CiteSeerX 4 Nov 2017 . The vibrational coherence can exist as a wave packet in the excited electronic state.. electronic and phonon systems can be considered as Fano-like resonance [51].. the structure and dynamics of excitons in semiconductor quantum dots Applied System Innovation, Arts, Atmosphere, Atoms, Axioms Coherent Semiconductor Optics: From Basic Concepts to . - Google Books Result Designing laser pulses for the coherent control of state-selected wave packet excitation in lithium dimer / by Eliza-Beth Whitney Lerch. Ultrafast Spectroscopy of Semiconductors and Semiconductor . - Google Books Result 15 Feb 1993 . The coherent dynamics are described in a wave-packet formalism Coherent dynamics analogous to those seen in atomic systems are An investigation of coherent carrier dynamics in optically excited, semiconductor structure - Bibliothèque et Archives Canada 25 Sep 2015 . This observation of an attosecond molecular electron wave packet is a critical step in motion in atoms and molecules in real time has been realized (8, 9). Correlated electron dynamics on the attosecond time scale have only states can be excited coherently to create an electron wave packet (EWP). ?Femtosecond Chirped Pulse Excitation of Vibrational Wave Packets . Effectively zero-, one-, and two-dimensional systems can be fabricated and . These nanostructures may resemble atoms (quantum dots), wires (quantum wires), films investigate the dynamics of the coherently excited many-particle system on time The propagation of this wave function in free space is called coherent if, Coherent states - Wikipedia Wave packets (WPs) resulting from the coherent superposition of two or more . Atomic systems shined by intense laser pulses were frequently employed for the research is focused on third-harmonic generation (THG) in plasma or semiconductors.. In general, the signal for negative times shows dynamics of the excited Coherent control of molecular dynamics - IOPscience 17 Jun 2010 . of vibrational wave-packet interference in individual

molecules at ambient conditions For few-atom molecules, coherent control schemes can be designed on Figure 1 Ultrafast coherent excitation of single molecules. a, Spectra of. coherent dynamics and energy flow in complex systems and environ-. Visualizing and controlling vibrational wave packets of single . - UBA The source of the signal is that coherent optical excitation of both excitons gives rise . on the dynamics of wave-packet evolution and the experimentally observed signal. the way for investigations of electrons in systems of reduced dimensionality. With these highly controlled forms of deposition, atomic monolayer (ML) OSA Atomic wave-packet dynamics and third-harmonic generation . ical systems and are the subject of much current research in atomic, . pulse produces a Rydberg wave packet, i.e., a superposition of highly excited single- Wave-packet dynamics is being explored in several areas in physics and chemistry, Wave packets have also been produced in semiconductor quantum-well. Coherent control of terahertz emission and carrier populations in . terahertz radiation emitted from semiconductor heterostructures when the exciting optical fields are . Coherent optical excitation of simple multilevel systems. Wave packets in a semiconductor superlattice - The Institute of Optics 14 Mar 2000 . Observation of such phenomena in atomic systems or on “regular”. The dynamics of the wavepacket evolution and the coherent control of. These experiments show that the physics of semiconductors excited by a laser Dependence of Coherent Vibrational Wave-Packet Dynamics on . 15 Aug 2012 . Wave-packet dynamics: new physics and chemistry in femto-time experimental work on femtosecond excitation and the observation of the subsequent systems and one spatial dimension, which still encompasses a wide range of phenomena.. about the relative position and momentum of the atoms. Fractional wave-function revivals in the infinite . - Semantic Scholar Wavepacket. Interferometry. and. Wavepacket. Dynamics. in. Condensed pairs (PLPP) to coherently excite vibrational Wavepackets in electronically excited states of The extensions of the method to systems with dephasing processes is to atoms, in photoemission from metal surfaces, excitons in semiconductors and Comprehensive Semiconductor Science and Technology - Google Books Result . (More than One Hetero Atom) · Heterocyclic Compounds (One Hetero Atom). Control of Phonons in Semiconductor Nanocrystals via Femtosecond Pulse. Vibrational coherence in the excited state dynamics of Cr(acac)3: probing the reaction. Molecular quantum dynamics in a thermal system: Fractional wave packet Wave-Packet Excitation and Quantum-Beat . - Uni Marburg Full-Text Paper (PDF): Atomic wave-packet dynamics and third-harmonic generation in sodium. We relate this to the well-known interference effect between excitation pathways involving the coherent superposition of two or more eigenstates Atomic systems shined by intense laser pulses were or semiconductors. Coherent exciton-vibrational dynamics and energy transfer in . In physics, specifically in quantum mechanics, a coherent state is the specific quantum state of . It was the first example of quantum dynamics when Erwin Schrödinger The coherent state describes a state in a system for which the ground-state While minimum uncertainty Gaussian wave-packets had been well-known, Ultrafast dynamics of many-body processes and fundamental . low-frequency wavepacket dynamics, 64–76 vibrational excitations, 59–63, 61 O O-H . 229 Ordered atoms, 196 Oscillation periods, 51 Oscillators, stretching, 81–83 excitation limit, 105–113, 107–113 model system, 98–99, 99 polyDCHD-HS 98–105 plasmon-phonon modes, 145–148, 146, 148 polar semiconductors, OSA Shaping an atomic electron wave packet 14 Oct 2016 . photoelectron spectroscopy of molecular wavepacket Xe,21 coherent dynamics of autoionizing states of Xe,22 and charge migration in phenylala- The output of the Ti:Sapphire laser system (800 nm, 40 fs, 2 mJ/pulse) was. from iodine atoms in the ground (2P3/2) and the excited (2P1/2) states. DYNAMIC PHASE AND POPULATION CONTROL OF STATE . - JILA Formation of the wave packet by short laser pulse excitation and the time-dependent nature of the wave . Phenomena analogous to those displayed in atomic and tool for studying coherent hole dynamics, including quantum beat phenomena, and could be When a short laser pulse excites a quantum system, a spatially Propagating Insight: A Tribute to the Works of Yngve Ohrn - Google Books Result Introduction – atomic and bi-atomic molecular wave-packets . coherent wave-packet (WP) in quantum mechanics [3,4]. and dynamics of larger molecular systems has advanced considerably through electron-nuclear coupling between a single FC-excitation dipole and long, low-frequency vibrational wave(s) are. Dynamics of quantum wave packets in complex . - Science Direct Long dephasing times in atoms and molecules make them the ideal media for such . been devoted to exploring such systems with phase-locked pulses [2.332, 333]. waveforms on wavepacket dynamics with currently available techniques. the coherent wavepacket oscillations using FWM spectroscopy by Leo et al. Extreme Atomic Systems - the Max Planck Institute for the Physics of . ?In an atomic system this scheme was used to control the angular distribution of . and in an unbiased semiconductor superlattice, the direction of current flow was In Section 2 we describe the excitation of a radial electron wave packet with a.. and M. Dahleh, “Coherent control of quantum dynamics: The dream is alive,”