Program & Abstracts

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HỘI NGHỊ VẬT LÝ LÝ THUYẾT TOÀN QUỐC LẦN THỨ 41

Nha Trang

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We analyze and compare three well-known types of polaritons: phonon polariton, exciton polariton and surface plasmon polariton. For first two types (phonon polariton and exciton polariton) the interaction between photon and media can be expressed via a longitudinal-transversal splitting (LT-splitting), while for third type of polariton (surface plasmon polariton) via the boundary condition. Considering the existence of an analogy picture of these three types of polaritons, an effective LT-splitting was introduced for surface plasmon polariton. The Nambu broken symmetry theory and Anderson-Higgs mechanism are discussed for lower branch of these polaritons.

Presenter: Duong Thi Ha

P.62 – Poster, NCTP-41

Influence of an External Magnetic Field on the Acoustomagnetoelectric Field in a Cylindrical Quantum Wire with a Parabolic Potential

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The acoustomagnetoelectric (AME) field in a cylindrical quantum wire with a parabolic potential (CQWPP) is theoretically investigated in the presence of an external magnetic field (EMF) by using the quantum kinetic equation for the distribution function of electrons scattering with internal acoustic phonon and electrons system interacting with external phonons in a CQWPP. The analytic expression for the AME field in the CQWPP in the presence of the EMF is obtained. The dependence of AME field on the frequency of external acoustic wave, the cyclotron frequency of the EMF and the intensity of the EMF is achieved. Theoretical results for the AME field are numerically evaluated, plotted and discussed for a specific CQWPP GaAs/GaAsAl. This result has shown that the dependence of the AME field on intensity of the EMF is many distinct maxima in the quantized magnetic region. These results also compared received fields with those for normal bulk semiconductors, quantum well and quantum wire to show the difference. The influence of an EMF on AME field in a CQWPP is newly developed.

Presenter: Nguyen Van Nghia

P.63 – Poster, NCTP-41

Effects of phonons in the excitonic insulator in the 2D extended Falicov-Kimball model

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Excitonic insulator instability in the 2D extended Falicov-Kimball model at zero temperature has been investigated when a coupling of electrons and vibrational degrees of freedom is taken into account. Adopting the unrestricted Hartree-Fock approximation, both electron-phonon interac-

tion and electron-electron interaction are treated in an equal footing. Numerical results show us that the excitonic insulator coexists with the lattice displacement only if the electron-phonon coupling is large enough. At a given small electron-phonon coupling, one finds a stability of excitonic insulator only in between two critical points of the electron-electron interaction strength. Detail ground state phase diagrams of the excitonic-insulator in the model then are presented and discussed.

Presenter: Do Thi Hong Hai

P.64 – Poster, NCTP-41

The orientation dependence of high-order harmonic generation and ionization probability of H2+ considering the nuclear vibration

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We investigate the dependence on the molecular orientation of high-order harmonic generation (HHG) and ionization probability by numerically solving the time-dependent Schrödinger equation of vibrating molecule exposed to an intense laser pulse. The results show that with nuclear motion, the intensity of HHG spectrum is minimized at the harmonic order less than that in case of fixed nuclear. The stronger the nuclei vibrate, the higher the orientation angle of the minimum is. Besides, the HHG intensity undergoes a minimum with increasing the orientation angle. In addition, at this "critical orientation angle", the phase of harmonic of vibrating molecule undergoes a jump by about Pi radian. The ionization probability decreases with increasing the orientation angle.

Presenter: Phan Thi Ngoc Loan

P.65 – Poster, NCTP-41

Controllable electronics structure in Zigzag Bilayer Graphene nanoribbons

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Graphene, consisting of one or a few crystalline monolayers of carbon atoms, stands out because of its electronic properties for applications in nanoelectronics. However, this material also suffers from a strong drawback for most electronic devices due to the gapless character of its band structure, which makes it difficult to switch off the current. In our model, we propose a method to control the gap. We use a transverse electric field generated by side gates and a vertical electric field generated by top/back gates to modulate the band gap and investigate the electronic structure of Zigzag Bilayer Graphene nanoribbons (Bernal stacking) based on the Tight Binding calculation method. The band structure of Zigzag Bilayer Graphene has flat bands, which appear in the range of 2pi/3 - pi . Under the effects of an external electric field, the gap is opened depending on its value. Specifically, in this case, the gap will be changed most when U is in the range of [0.5V, 1.5V]. Comparing the electric fields perpendicular to parallel the difference was found to be larger in the parallel field, but the arranging order of the charged particles was changed to a greater amount in the shape of band structure of Zigzag Bilayer Graphene