TRUNG TÂM VẬT LÝ LÝ THUYẾT – VIỆN VẬT LÝ
HỘI VẬT LÝ VIỆT NAM

CHỦ TỊCH HỘI NGHỊ

Nguyễn Ái Việt (VVL)

BAN TỔ CHỨC

Nguyễn Hồng Quang (VVL), Trưởng ban
Hoàng Dũng (ĐHQG HCM), Phó Trưởng ban
Bạch Thành Công (ĐHKHTN HN)
Phó Nguyệt Hằng (ĐHBK HN)
Lê Văn Hoàng (ĐHSP HCM)
Đinh Xuân Khoa (ĐHSP Vinh)
Nguyễn Anh Kỳ (VVL)
Nguyễn Huỳnh Phán (ĐHQB Đồng Hới)
Trần Công Phong (ĐHSP Huế)
Đặng Văn Soa (ĐHSP HN)

BAN CHƯƠNG TRÌNH

Nguyễn Văn Liễn (VVL), Trưởng ban
Nguyễn Bá Ân (VVL)
Vũ Văn Hùng (ĐHSP HN)
Nguyễn Quốc Khánh (ĐHKHTN HCM)
Hoàng Ngọc Long (VVL)
Đỗ Hoàng Sơn (ĐHQG HCM)
Vũ Ngọc Tước (BHBK HN)

BAN TỔ CHỨC ĐỊA PHƯƠNG

Nguyễn Huỳnh Phán (ĐHQB Đồng Hới)
Võ Thị Dung (ĐHQB Đồng Hới)
Nguyễn Đình Hùng (ĐHQB Đồng Hới)
Trần Ngọc (ĐHQB Đồng Hới)
Bùi Khắc Sơn (ĐHQB Đồng Hới)
Lê Thị Hoài Thu (ĐHQB Đồng Hới)

BAN THƯ KÝ

Phùng Văn Đồng (VVL), Trưởng ban
Đào Thị Hồng (VVL)
Phạm Thị Lan Phương (ĐHQB Đồng Hới)
Đặng Thị Hoàng Yến (ĐHQB Đồng Hới)

CÁC ĐƠN VỊ TÀI TRỢ

Viện Khoa học và Công nghệ Việt Nam
Trung tâm Vật lý lý thuyết, Viện Vật lý Hà Nội
Đại học Quảng Bình
Viện Vật lý Kỹ thuật Hà Nội
Ban Ứng dụng Triển khai công nghệ Đại học Khoa học Tự nhiên Hồ Chí Minh
Trường Đại học Sư phạm Tp. Hồ Chí Minh

CHƯƠNG TRÌNH HỘI NGHỊ

HỘI NGHỊ VẬT LÝ LÝ THUYẾT TOÀN QUỐC LẦN THỨ 34
(Thành phố Đồng Hới, 03 – 06/ 08/2009)

Thứ Hai, ngày 03 tháng 08 năm 2009

BUỔI SÁNG:

08h00 – 09h00: **Đăng ký đại biểu**

09h00 – 09h30: **Khai mạc**

Chủ tọa: Nguyễn Hồng Quang

Nguyễn Văn Hiệu, **Perspective Topics in Physics of Quantum Information.** ***Báo cáo mời***

10h00 – 10h30: **Nghỉ giữa buổi**

10h30 - 11h30: **Phần trình bày báo cáo miệng**
Mỗi báo cáo trình bày 20′

Chủ tọa: Bạch Thành Công

Lê Tuấn, Nguyễn Thành Tiên, Trần Thị An, Đoàn Nhật Quang, **Electron Scatterings Due To The Charge Fluctuations In Roughened O-Polar Face Of ZnO Surface Quantum Wells**

Nguyễn Duy Vỹ, Cao Huy Thiện, Trần Thoại Duy Bảo, **Coherence Kinetics of Condensed Microcavity Polaritons**

Nguyễn Hải Sơn, **Spectroscopy of an InAs/GaAs single quantum dot in a crystal photonic cavity**

BUỔI CHIỀU:

14h00 – 15h10: **Phần trình bày báo cáo miệng**
Báo cáo mời 30', các báo cáo khác 20'

Chủ tọa: Nguyễn Viễn Thọ

Phùng Văn Đồng, Hoàng Ngọc Long, Đặng Văn Soa, Nguyễn Huy Thảo, **Warped Spacetime: Consequences and Signatures**

Phạm Quang Hưng, Nguyễn Như Lê, **The Production And Decays Of Mirror Charged Leptons And Electroweak-Scale Right-Handed Neutrinos**

Nguyễn Tuấn Anh, Đinh Thanh Tâm, Đỗ Hữu Nha, **The Four-Quark Coupling Bag Model for Nuclear Matter**

15h10 – 16h00: Nghỉ giữa buổi và **Phần trình bày báo cáo treo (I)**

Chủ tọa: Đặng Văn Soa

[P - 1] Lê Thọ Huệ, Hà Thanh Hùng, Hoàng Ngọc Long, Nguyễn Huy Thảo, Đinh Phan Khôi, **Symmetry Factor of Feynman Diagrams**

[P - 2] Võ Văn Ớn, **Magneto- Gravitational Field in the Vector Model for Gravitational Field**

[P - 3] Nguyễn Hùng Sơn, **Tomographic Probability Representation of Quantum Field**

[P - 4] Lưu Thi Kim Thanh, Dương Đại Phương, **Fermi Oscillator as a q - Deformed Bose Oscillator**

[P - 5] Nguyễn Văn Thuận, **Specific Solutions In SU(2) Gauge Field Couples To Massless Scalar Field**

[P - 6] Nguyễn Thị Hà Loan, Đỗ Thi Thu Thủy, Vũ Quốc Hùng, **The deformed crystal lattice vibration of kind difference atomic string and statistics of this vibration.**

[P - 7] Nguyễn Minh Tuấn, Koval. T.V, **Khảo Sát Trạng Thái Tĩnh Của Chùm Electron Trong Đi-ốt Và Trong Không Gian Trôi**

[P - 8] Nguyễn Trí Lân, **Hatree – Fock – Bogoliubov Approximation in Functional Integral Formalism**

[P - 9] Dương Xuân Long, Hoàng Ngọc Cầm, **The complex states of many-particle correlations in quasi - two-dimentional semiconductor nanostructures**

[P - 10] Nguyễn Viết Minh, **Piezoelectric Effect on the Electron Mobility in an Unintentionally Doped GaN/AlGaN Surface Quantum Well**

[P – 11] Trần Văn Quảng, Phạm Thị Thanh Nga, Nguyễn Toàn Thắng, **Some Thermal Properties of the Fermionized Heisenberg Antiferromagnet on the Triangular Lattice**

[P - 12] Nguyễn Văn Nghĩa, Nguyễn Vũ Nhân, Nguyễn Quang Báu, **The Acoustomagnetoelectric Effect in Quantum Wires**

[P - 13] Hoàng Văn Ngọc, Nguyễn Đình Dũng, **Total Diffraction Reflection of Polarized Neutrons by Crystal Surface With Polarized Nucleus, Placed in Periodical Variable Magnetic Field**

[P - 14] Nguyễn Thị Thùy Nhung, Lê Thanh Tùng, Nguyễn Đức Giang, Ngô Văn Thanh, Nguyễn Ái Việt, **Combined studies of cell response to electric pulses: A simple approach**

[P - 15] Huỳnh Vĩnh Phúc, Lê Thị Thu Phương, Trần Công Phong, **Calculation Of The Optical Absorption Power In Rectangular Quantum Wire By Using State-Independent Projection Technique**

[P - 16] Lê Thị Thu Phương, Huỳnh Vĩnh Phúc, Lê Đình, Trần Công Phong, **Nonlinear Optical Absorption of Intensity Terahertz Radiation by Confined Electrons in Cylindrical Quantum Wires**

[P - 17] Ngô Thị Thu Phương, Nguyễn Thị Thương, Ngô Văn Thanh, Nguyễn Ái Việt, **Secondary electrons production in the ionization of tissue by ion beams and their DNA-damage**

[P - 18] Nguyễn Minh Thảo, Nguyễn Hồng Quang, **Nghiên cứu năng lượng tương quan đối với exciton tích điện trong chấm lượng tử 2 chiều**

[P - 19] Lê Nguyễn Minh Thông, Cao Huy Thiện, **Polariton Parametric Amplification in Semiconductor Microcavity Investigated with a Boltzmann Approach**

[P - 20] Nguyễn Thị Thương, Ngô Thị Thu Phương, Ngô Văn Thanh, Nguyễn Ái Việt, **Model of Subdiffusion Within Flavin Reductase Protein with Morse Potential**

[P - 21] Vũ Văn Hùng, Nguyễn Thi Thu Hiền, **Study of Elastuc Moduli of Interstitial Alloys by Statistical Moment Mothed: Temperature Dependence**

[P - 22] Vũ Văn Hùng, Phan Thị Thanh Hồng, Nguyễn Thanh Hải, **Influence of Temperature on Self Diffusion in GaAs Crystal**

[P - 23] Vũ Văn Hùng, Nguyễn Quang Học, Đinh Quang Vinh, **Thermodynamic Property of Some Quantum Crystals under Pressure**

[P - 24] Thái Thị Minh Nguyệt, Vũ Ngọc Sáu, Nguyễn Huy Bằng, **Optical Soliton Propagation in Single Mode Optical Fibers in The Presence of Stimulated Raman Scattering**

[P -25] Nguyễn Văn Phú, Đinh Văn Hoàng, **Investigation Of Wavelength Shifting In The DFB Laser With Two Sections By Using Injection Current I2 Into Saturable Absorber Section**

[P - 26] Mai Văn Lưu, Hồ Quang Quý, Vũ Ngọc Sáu, **Matching of Pump and Mode volumes inside Laser Diodes side-pumped Laser Rod**

[P - 27] Vũ Ngọc Sáu, B. Brzostowski, Cao Long Vân, Đinh Xuân Khoa, B. Grabiec, **Four-level Model For EIT of Cold 85^Rb**

[P - 28] Hồ Công Sơn, **Quantum Dynamics of Spin-Qubits in a Spin-Star Environment**

[P - 29] Thái Doãn Thanh, Lê Văn Nam, Nguyễn Huy Công, **Quantum interference effects in resonance fluorescence spectra of Y- type four – level atom**

[P - 30] Thái Doãn Thanh, Lê Văn Nam, Nguyễn Huy Công, **The resonance fluorescence of a three-level atom in the presence of a squeezed broad-band vacuum and quantum interference**

[P - 31] Trịnh Văn Mùng, Hoàng Quốc Hoàn, Phạm Khắc Hùng, **Computer Simulation Of Interstitial Diffusion In Disordered Systems**

[P - 32] Phan Thị Cẩm Nhung, Nguyễn Ngọc Ty, Lê Văn Hoàng, **High Harmonic Generation Spectra of Basic Bases of DNA Interacting with Ultra-Short Laser Pulses**

[P - 33] Phan Hoàng Chương, **Cấu Trúc Hình Học Giả Định Của Các Boson**

[P - 34] Nguyễn Ngọc Ty, Tăng Thị Bích Vân, Lê Văn Hoàng, **Tracking Acetylene/Vinylidene Isomerization Process by Ultrashort Laser Pulses using High Harmonic Generation**

16h00 – 17h00: **Phần trình bày báo cáo miệng**
Mỗi báo cáo trình bày 20'

Chủ tọa: Hoàng Ngọc Long

Nguyễn Suân Hãn, Huỳnh Văn Trung, Lê Hải Yến, **Glauber Type Representation for the Scattering Amplitude of High-Energy Dirac Particles on the Smooth Gravitational Potential**

Nguyễn Viễn Thọ, Nguyễn Quốc Hoàn, **On the Yang-Mills Gravity**

Nguyễn Chí Linh, Đỗ Hoàng Sơn, **Tán Xạ gg →bb H Tại LHC: Bài Toán Gần Đúng Born.**

Thứ Ba, ngày 04 tháng 08 năm 2009

BUỔI SÁNG:

08h30 – 10h00: **Phần trình bày báo cáo miệng**
Báo cáo mời 30', các báo cáo khác 20'

Chủ tọa: Nguyễn Toàn Thắng

Lê Văn Hoàng, **Molecular Imaging with Ultra-Short Laser Pulses Using High Harmonic Generation,** ***Báo cáo mời***

PiereJouy, **Electroluminescence from intersubband cavity polariton states in the mid-infrared domain**

Vũ Văn Hùng, Hồ Khắc Hiếu, Nguyễn Văn Hùng, **The Pressure Dependence of EXAFS Debye-Waller Factors in Crystals**

Lê Thế Vinh, Nguyễn Minh Quân, Dương Công Hiệp, Nguyễn Thành Tín, Nguyễn Tất Đạt, Đổng Quốc Việt, **Computer Simulation of Microstructure in Disordered Systems**

10h00 – 10h30: **Nghỉ giữa buổi**

10h30 – 11h30: **Phần trình bày báo cáo miệng**
Mỗi báo cáo trình bày 20'

Chủ tọa: Nguyễn Bá Ân

Margarita A. Man'ko, **New Entropic Bounds in Quantum Information Processing**

Đinh Xuân Khoa, Cao Long Vân, Vũ Ngọc Sáu, Nguyễn Huy Bằng, **Five-level Model For Cascade Scheme of EIT In Cold 85Rb Atoms**

Lê Thị Hà Linh, **Explicit Construction of Cluster States of Systems of Two and Three Spin-Qubits**

BUỔI CHIỀU:

14h00 – 15h20: **Phần trình bày báo cáo miệng**
Mỗi báo cáo trình bày 20'

Chủ tọa: Nguyễn Quang Báu

Vũ Ngọc Tước, Nguyễn Viêt Minh, **First Principle Study on AlN Nano Wire**

Benedict O' Donnell, **Improved light trapping in silicon nanowire solar cells**

Nguyễn Anh Tuấn, Shin - Inchi Katayama, Dam Hieu Chi, **Density - Functional Study of Magneto - Structural Correlation in Mn4 Molecules: A way to develop Single - Modecule Magnets**

Hoàng Đình Tiến, Ngô Văn Thanh, Nguyễn Ái Việt, **Ising spin glass on a FCC lattice: a Monte-Carlo simulation**

14h20 – 16h10: Nghỉ giữa buổi và **Phần trình bày báo cáo treo (II)**

Chủ tọa: Đỗ Hoàng Sơn

[P - 35] Nguyễn Ngọc Ty, Lê Văn Hoàng, **Genetic Algorithm and Retrieval of Interatomic Separations of the Complex Molecules by Ultrashort Laser Pulses**

[P - 36] Phan Hoàng Chương, **Nguyên Lý Bất Định Là Hệ Quả Của Chuyển Động Hỗn Độn**

[P - 37] Phan Hoàng Chương, **Nghiệm Của Phương Trình Schrodinger Của Vi Hạt Chuyển Động Ngẫu Nhiên Trong Trường Thế**

[P - 38] Nguyễn Chính Cương, **Squarks decays into quark and gluinos in the MSSM**

[P - 39] Hà Huy Bằng, Nguyễn Thị Thu Hương, **The Production of Gluino Pairs in High Energy e+e- Collision within The MSSM with Complex Parameters**

[P - 40] Nguyễn Công Kiên, Nguyễn Anh Kỳ, **Q-boson-fermion Realizations of Some Quantum Superalgebras in Coherent State basis**

[P - 41] Nguyễn Thi Hà Loan, Đinh Xuân Cấp, Đinh Văn Tình, **q- Deformed crystal lattice vibration of generic atomic string**

[P - 42] Phan Đức Anh, Quách Khả Quang, Trần Thanh Thúy, Vũ Thúy Hường, Ngô Văn Thanh, Nguyễn Ái Việt, **Van Der Waals and Casimir Interactions of some Graphene, Carbon Nanotube and Nanoparticale Systems**

[P - 43] Trần Ngọc Bích, Trần Phan Thùy Linh, Trương Thị Hồng Nhung, Trần Công Phong, **Comparision of Two Techniques in Theory of Phonon-induced Cyclotron Resonance Linewidths for Quantum Wells**

[P - 44] Phó Thị Nguyệt Hằng, Phạm Thùy Dung, Nguyễn Hữu Hải, **The Reflection and Transmission of the Electromagnetic Wave in Multilayers Structures Composed from Cholesteric Liquid Crystals**

[P - 45] Phan Thị Kim Loan, Nguyễn Hải Châu, Trần Nguyên Dũng, **Resistance and shot noise of Graphene n – p – n junctions**

[P - 46] Trần Thị Hải, Nguyễn Trung Hồng, Nguyễn Huyền Tụng, Đoàn Nhật Quang, **The Channel-Width Dependence Of The Low-Temperature Hole Mobility In Ge-rich Narrow Square Quantum Well Studied by the Band-bending Method**

[P - 47] Lê Đình, Nguyễn Đình Hiên, Lê Văn Hưng, Trần Công Phong, **Electron-Phonon Resonance and Absorption Line-widths in Quantum Wires**

[P - 48] Nguyễn Quang Báu, Nguyễn Văn Hiếu, Nguyễn Thị Thúy, Trần Công Phong, **The Nonlinear Acoustoelectric Effect in a Superlattice**

[P - 49] Lê Văn Hoàng, Phan Ngọc Hưng, Nguyễn Lê Đăng, **Generalization of the Dirac and Yang Monopoles to a 9-Dimensional Space – a Non-Abelian SO(8) Monopole**

[P - 50] Bùi Đình Hợi, Trần Công Phong, Võ Thành Lâm, **Magneto-phonon Resonance in Quantum Wells with Parabolic Potential**

[P - 51] Lê Thái Hưng, Nguyễn Đức Thắng, Nguyễn Thị Hà Thu, Nguyễn Vũ Nhân, Nguyễn Quang Báu, **The Effect of Confined Phonons on the Nonlinear Absorption Coefficient of a Strong Electromagnetic Wave by Confined Electrons in Compositional Superlattices and Doped Superlattices**

[P - 52] Vũ Thúy Hường, Quách Khả Quang, Trần Thanh Thúy, Phan Đức Anh, Ngô Văn Thanh, Nguyễn Ái Việt, **pH-Dependence of the Optical Bio-Sensor Based on DNA - Carbon Nanotube**

[P - 53] Võ Thành Lâm, Trần Công Phong, Bùi Đình Hợi, **Magneton-Phonon Resonance Line-width in Quantum Wells**

[P - 54] Vũ Văn Hùng, Đặng Thanh Hải, Hoàng Văn Tích, **Study of Structural Phase Transformation and Melting Temperature of Metals: Pressure Dependence**

[P - 55] Vũ Văn Hùng, Nguyễn Thị Hằng, Cao Huy Phương, **Study of Thermodynamic properties and self-diffusion of AuCu Superlattice**

[P - 56] Nguyễn Huy Bằng, Đinh Xuân Khoa, Lê Cảnh Trung, Trần Mạnh Cường, **Accurate Potential Energy Curve for The 31Π State of NaLi Molecule**

[P - 57] Trương Minh Đức, Hoàng Phương Hà, **New Entanglement Criterion For Two-Mode States**

[P - 58] Nguyễn Văn Hóa, Hồ Quang Quý, Nguyễn Thị Thanh Tâm, Vũ Ngọc Sáu, **Transmittance Function Of Two-ports Nolinear Fiber Mach-Zehnder Interferometer**

[P - 59] Nguyễn Bá Ân, Trần Thái Hòa, **Generation of free-travelling four-mode cluster-type entangled coherent states**

[P – 60] Trương Minh Đức, Nguyễn Thị Xuân Hoài, **Entanglement Criterion for Bipartite Quantum States: Application**

[P - 61] Nguyễn Văn Hợp, **Density matrix of strongly coupled quantum dot microcavity system**

[P - 62] Trương Minh Đức, Trần Lê Hưng, **Higher-Order Squeezing and Antibunching of SUq(1,1) q-Coherent States**

[P - 63] Lê Hoàng Anh, Đỗ Phương Liên, **Investigation of Thermodynamic Properties of Liquid Transition Metals**

[P - 64] Lê Hoàng Anh, Đỗ Phương Liên, **Investigation of Structural and Electronic Propertiesof Liquid Transition Metals and Their Alloys**

[P - 65] Nguyễn Phương Duy Anh, Nguyễn Văn Hòa, Lê Văn Hoàng, **The Operator Method for non-Perturbation Calculations of Hydrogen Spectra in a Magnetic Field of Arbitrary Strength**

[P - 66] Nguyễn Tiến Cường, Nguyễn Anh Tuấn, Đỗ Văn Thanh, Nguyễn Hoàng Linh, Nguyễn Thùy Trang, Phạm Hương Thảo, Bạch Thành Công, **Density-Functional Study of Jahn-Teller Effect in BaTiO3**

[P - 67] Phạm Hữu Kiên, Vũ Văn Hùng, Phạm Khắc Hùng, Vương Thị Thúy, **ComputerSimulation On Local Structure And Diffusion In System Li2O-SiO2**

Từ 16h10 đến 18h10: **Gặp gỡ Đồng Hới 2009**

Chủ tọa: Nguyễn Văn Liễn

1. Ban tổ chức địa phương, **Quảng Bình: Con người, lịch sử và văn hóa**

2. Nguyễn Văn Hiệu, **Kỷ niệm 100 năm ngày sinh Viện sĩ Nikolai Nikolaevich Bogoliubov 21/8/1909-21/8/2009.**

19h00 : Liên hoan thân mật

Thứ Tư, ngày 05 tháng 08 năm 2009

BUỔI SÁNG:

08h30 – 10h00: **Phần trình bày báo cáo miệng**
Báo cáo mời 30', các báo cáo khác 20'

Chủ tọa: Vũ Văn Hùng

Vladimir I. Man'ko, **Quantum Information and Probability Description of Quantum States.** ***Báo cáo mời***

Bạch Thành Công, Phạm Hương Thảo, Nguyễn Tiến Cường, **Theory For Magnetic Orders in Thin Films**

Phạm Công Huy, Nguyễn Hải Châu, **Electronic band structure of Graphene Superlattices**

Trần Thị Hải, Nguyễn Trung Hồng, Nguyễn Huyền Tụng, Đoàn Nhật Quang, **Mobility Enhancement In Square Quantum well: Symmetric Modulation of Envelop Wave Function**

10h00 – 10h30: **Nghỉ giữa buổi**

10h30 – 11h30: **Phần trình bày báo cáo miệng**
Mỗi báo cáo trình bày 20'

Chủ tọa: Vũ Ngọc Tước

Hoàng Đình Triển, Nguyễn Quang Báu, **The Nonlinear Absorption Coefficient of a Strong Electromagnetic**

Wave by Confined Electrons in Cylindrical Quantum Wires with Parabolic Potential

Trần Công Phong, Nguyễn Thị Lệ Thủy, Võ Thành Lâm, Lương Văn Tùng, **Optical Transition Linewidths due to Piezoelectric Phonon Scattering in Doped Semiconductor Superlattices**

Nguyễn Như Đạt, **Lo-Phonon-Limited Electron Mobility in a Polar Semiconductor Quantum Wire**

BUỔI CHIỀU:

14h00 – 15h10: **Phần trình bày báo cáo miệng**
Báo cáo mời 30', các báo cáo khác 20'

Chủ tọa: Nguyễn Suân Hãn

Truong Nguyen Tran, **Effective Range Theory of Bethe-Landau-Schwinger and Chiral Perturbation Theory of Weinberg**. ***Báo cáo mời.***

Phan Hồng Liên, **One Loop Free Energy Density for Background Fields Gauge at Finite Temperature**

Trần Hữu Phát, Lê Viết Hòa, Nguyễn Tuấn Anh, Nguyễn Văn Long, **Phase Transition in Binary Mixture of Bose Gases**

15h10 – 15h30: **Nghỉ giữa buổi**

15h30 – 16h10: **Phần trình bày báo cáo miệng**
Mỗi báo cáo trình bày 20'

Chủ tọa: Hoàng Dũng

Võ Văn Thuận, Hoàng Văn Khanh, **Search for High Energy Skimming Neutrinos at a Surface Detector Array**

Đặng Văn Soa, Hoàng Ngọc Long, Phùng Văn Đồng, T. H. Thao, Trịnh Thị Hương, **Gauge – Higgs Unification on Orbifold.**

16h10: Bế mạc hội nghị

Họp Hội Vật lý Lý thuyết

Chủ tọa: Hoàng Dũng

Thứ Năm, ngày 06 tháng 08 năm 2009

Thăm quan Động Phong Nha - Kẻ Bàng cả ngày

TÓM TẮT BÁO CÁO

HỘI NGHỊ VẬT LÝ LÝ THUYẾT TOÀN QUỐC LẦN THỨ 34
(Thành phố Đồng Hới, 03 – 06/ 08/2009)

I. VẬT LÝ NĂNG LƯỢNG CAO, HẠT CƠ BẢN, HẠT NHÂN, THIÊN VĂN

1. Effective Range Theory of Bethe-Landau-Schwinger and Chiral Perturbation Theory of Weinberg

Truong Nguyen Tran

It is emphasized that the effective range theory of Bethe-Landau-Schwinger, derived from a potential picture and the Schrodinger equation, is equivalent to the requirement of the conservation of probability(unitarity)at low energy. Although this concept was applied to the low energy physics in the 50's and 60's and was correctly applied to of Chiral Theories by Lehmann later, it was completely ignored by

Weinberg and his followers in their perturbative approach to chiral perturbation theories. In this talk I shall show that a coherent approach to the low energy phenomena must be based on the requirement of Bethe-Landau-Schwinger

Người trình bày: **Truong Nguyen Tran**

2. Warped Spacetime: Consequences and Signatures

Phùng Văn Đồng, Hoàng Ngọc Long, Đặng Văn Soa, Nguyễn Huy Thảo

In this talk, we give an introduction of Randall-Sundrum model based on five-dimensional warped spacetime. This model can explain the hierarchy problem between weak scale and gravity scale, in different to large extradimension and supersymmetry. We also present consequences and KK signatures when bulk gauge bosons and fermions. A sketch of black hole generation at LHC and flavor problem in the model is also given.

Người trình bày: **Phùng Văn Đồng**

3. Glauber Type Representation for the Scattering Amplitude of High-Energy Dirac Particles on the Smooth Gravitational Potential

Nguyễn Suân Hãn, Huỳnh Văn Trung, Lê Hải Yến

By the functional integration method the deduction of the eikonal representation for scattering amplitude of the Dirac particles on the smooth gravitational potential is performed . This method generalizing the usual operation of taking the square of the Dirac equation is proposed for obtaining the functional integral representation of the amplitude. It has shown that taking into account of spin of particles leads to new term which is responsible for the spin flip in the scattering processes.

Người trình bày: **Nguyên Suân Hãn**

4. One Loop Free Energy Density for Background Fields Gauge at Finite Temperature

Phan Hồng Liên

The effective action and background field method have been applied to investigate free energy density for non-Abelian gauge theory at finite temperature, in which quantum corrections are included and certain symmetries of generating functional are restored. Renormalization is also considered. We give result for the one free energy of gauge theory at high temperature and non-zero chemical potential, correcting a result previously at zero temperature and density.

Người trình bày: **Phan Hồng Liên**

5. Tán Xạ gg →bb H Tại LHC: Bài Toán Gần Đúng Born

Nguyễn Chí Linh, Đỗ Hoàng Sơn

Trong khuôn khổ tán xạ proton-proton sinh bb H tại LHC, chúng tôi khảo sát tiết diện tán xạ gg → bb H tại gần đúng LO trong khuôn khổ của mô hình chuẩn. Sử dụng phương pháp bình phương biên độ tán xạ, chúng tôi thu được sự phụ thuộc của tiết diện tán xạ vào khối lượng của hạt Higgs cũng như phân bố của tiết diện tán xạ theo xung lượng ngang và pseudo-rapidity của bottom quarks và Higgs. Các kết quả mà chúng tôi thu được cho thấy Higgs được sinh ra trong kênh gg → bb H phân bố tập chung quanh góc 270 và 1530 so với trục tán xạ và với xung lượng ngang khoảng 45 (GeV). Kết quả mà chúng tôi thu được phù hợp với kết quả tính toán độc lập [1] sử dụng phương pháp Helicity amplitude

Người trình bày: **Nguyễn Chí Linh**

6. Gauge – Higgs Unification on Orbifold

Đặng Văn Soa, Hoàng Ngọc Long, Phùng Văn Đồng, T. H. Thao, Trịnh Thị Hương

In this talk, we introduce the unification of gauge fields and fundamental Higgs fields in higher-dimensional gauge theories based on Orbifold. Hosotani mechanism at the fixed points of Orbifold is obtained. An explicit model with the gauge group SU(3) X U(1) on Orbifold is given in detail.

Người trình bày: **Đặng Văn Soa**

7. The Four-Quark Coupling Bag Model for Nuclear Matter

Nguyễn Tuấn Anh, Đinh Thanh Tâm, Đỗ Hữu Nha

A four-quark coupling model, based on quark degrees of freedom, with quarks coupled to their scalar and vector condensates is considered. The model describes nuclear matter as non-overlapping nucleon bags bound by the self-consistent exchange of scalar and vector mesons, that produces a mechanism for saturation. We obtain a new expression of effective nucleon mass, which depends on the scalar density factor. The effects of nucleon structure on nucleus is due to this factor.

Người trình bày: **Đinh Thanh Tâm**

8. On the Yang-Mills Gravity

Nguyễn Viễn Thọ, Nguyễn Quốc Hoàn

The parallel between Yang-Mills theory and General Relativity is an attractive topic that motivated a lot of interesting researchs. Various versions of the gauge theory of gravity were proposed which provided a deep understanding of such basis concepts as the geometry of

space-time, the connection between symmetry and dynamics. In this work we consider the problem of interaction between intrinsic degrees of freedom of particles with the Lorentz gauge field solution that has the same singular feature as for the Schwarzchild solution of General Relativity. The radial free-fall of particles toward a central mass, the possibility of planar motions, and the perihelion advance are examined in comparison with the geodetic motion in the Schwarzchild space-time and astrophysical data. The results can be considered as an experimental evidence for the existence of "internal Lorentz symmetry" of point particles that is analogue to internal unitary symmetries.

Người trình bày: **Nguyễn Viễn Thọ**

9. Cấu Trúc Hình Học Giả Định Của Các Boson

Phan Hoàng Chương

Nếu xem các hạt cơ bản như các mặt (brame S) trong không gian 11 chiều. Giả định các Fermion là các mặt cầu và các boson là các mặt xuyến. Từ tính chất của mặt xuyến ta viết các phương trình cho các hạt có spin = 2, spin = 1 và spin = 0. Từ đó đưa ra một cách giải thích về bốn tương tác của vật chất và đưa ra một mô hình tương tác của các hạt cơ bản.

Người trình bày: **Phan Hoàng Chương**

10. Nguyên Lý Bất Định Là Hệ Quả Của Chuyển Động Hỗn Độn

Phan Hoàng Chương

Xét vi hạt chuyển động tự do, nghiệm của phương trình Schrodinger nếu tính đến chuyển động hổn độn của vi hạt, ta kết hợp với phương trình khuyếch tán ngẫu nhiên dạng Brown với tọa độ là biến Wiener. Sử dụng công cụ của giải tích ngẫu nhiên ta suy ra được dạng hàm sóng của chuyển độn tự do và thu được các đại lượng ngẫu nhiên như động lượng, động năng ... Từ đây xét biểu thức của tác dụng ngẫu nhiên ta thu được hệ thức bất định.

Người trình bày: **Phan Hoàng Chương**

11. Nghiệm Của Phương Trình Schrodinger Của Vi Hạt Chuyển Động Ngẫu Nhiên Trong Trường Thế

Phan Hoàng Chương

Xét vi hạt chuyển động trong trường thế V, khi tính đến chuyển động hổn độn của vi hạt ta sử dụng các công cụ của giải tích ngẫu nhiên như: khai triển Ito-Taylor, khai triển Fourier-Hermit, ... Đặc biệt ta sử dụng đạo hàm hình thức theo biến Wiener để đưa ra một phương pháp tìm nghiệm giải tích. Từ đây ta thu được nghiệm của phương trình Schrodinger dưới dạng chuỗi Hermit và phân bố Wiener.

Người trình bày: **Phan Hoàng Chương**

12. Squarks decays into quark and gluinos in the MSSM

Nguyễn Chính Cương

We present a phenomenological study of squarks (stop and sbottom) decays into quarks (top and bottom) and gluinos in the Minimal Supersymmetric Standard

Model (MSSM). The formulae of the decay width and numerical results are given. The one-loop vertex correction, wave-function correction and renormalization of the bare couplings to the decay width have been caculated. We have found that the effect of complex parameters At and Ab can be quite significant in a large region of the MSSM parameter space.

Người trình bày: **Nguyễn Chính Cương**

13. The Production of Gluino Pairs in High Energy e+e- Collision within The MSSM with Complex Parameters

Hà Huy Bằng, Nguyễn Thị Thu Hương

We present a phenomenological study of gluino pairs production in e+e- annihilation in the MSSM with complex parameters Af, \mu . We find that the effect of the phases on the cross-section of gluinos production can be quite significant in a large region of the MSSM parameter space. This could have important implications for gluino searches and the MSSM parameter determination in future collider experiments.

Người trình bày: **Nguyễn Thị Thu Hương**

14. Q-boson-fermion Realizations of Some Quantum Superalgebras in Coherent State basis

Nguyễn Công Kiên, Nguyễn Anh Kỳ

For the last several years, super coherent states (CS's) have been used by some authors to construct representations (boson-fermion realizations) of super-

algebras such as , , and . These investigations, however, have been made for only a few cases of quantum superalgebras, e. g., . In this report the method is applied to the quantum superalgebra . First, representations in the CS basis of the superalgebra , as an intermediate step, and then, representations in the CS basis of its quantum deformation , are constructed. Our results lead to a boson-fermion realization more general than those obtained earlier by other authors. We expect that the present results will be useful in investigations of current super-algebras, quantum super-algebras, and conformal field theories.

Người trình bày: **Nguyễn Công Kiên**

15. The Production And Decays Of Mirror Charged Leptons And Electroweak-Scale Right-Handed Neutrinos

Phạm Quang Hưng, Nguyễn Như Lê

The model of electroweak-scale right-handed neutrino mass based on the assumption of the existence of mirror fermions leads to the Majorana mass of the right-handed neutrino being of the order of the electroweak scale or smaller. In the present paper, the total decay width of right-handed neutrinos and mirror charged leptons has been calculated. Analytical expressions for the total decay width of those particles are obtained. The numerical results show that when masses of leptons vary, the order of maximum value of decay width is O(10 GeV), i.e, those leptons can be detected in

colliders. The main signatures would be like-sign dileptons with displaced vertices plus one or two W's.

Người trình bày: **Nguyễn Như Lê**

16. q- Deformed crystal lattice vibration of generic atomic string

Nguyễn Thị Hà Loan, Đinh Xuân Cấp, Đinh Văn Tình

We construct a q - deformed crystal lattice vibration for generic atomic string and consider an energy spectrum of this vibration.

Người trình bày: **Nguyễn Thị Hà Loan**

17. Symmetry Factor of Feynman Diagrams

Lê Thọ Huệ, Hà Thanh Hùng, Hoàng Ngọc Long, Nguyễn Huy Thảo, Đinh Phan Khôi

The symmetry factor of Feynman diagrams for real and complex scalar fields is presented. Being analysis of Wick expansion for Green functions, the mentioned factor in general form is derived. The symmetry factor can be separated into two ones corresponding to that of connected and vacuum diagrams. The determination of symmetry factors for the vacuum diagrams is necessary as they play a role in the effective action and phase transitions in cosmology.

Người trình bày: **Hoàng Ngọc Long**

18. Magneto- Gravitational Field in the Vector Model for Gravitational Field

Võ Văn Ớn

In this paper, we present the existence of magneto-gravitational field in the vector model for gravitational field and its effects in the Solar system. The results are the same with ones of Einstein 's theory in the first order of approximate and agree with experiments.

Người trình bày: **Võ Văn Ớn**

19. Tomographic Probability Representation of Quantum Field

Nguyễn Hùng Sơn

The tomographic approach to quantum fields is developed. Tomographic symbols of the field operators are introduced and their properties are studied. Relation to classical field theory is discussed.

Người trình bày: **Nguyễn Hùng Sơn**

20. Fermi Oscillator as a q - Deformed Bose Oscillator

Lưu Thị Kim Thah, Dương Đại Phương

We consider a version of q-deformed harmonic oscillators. The matrix representations and their statistical distributions have been derived. From these results we recover the matrix representations of the Fermi operators and Fermi- Dirac statictics as a special case of q-boson.

Người trình bày: **Lưu Thị Kim Thanh**

21. Specific Solutions In SU(2) Gauge Field Couples To Massless Scalar Field

Nguyễn Văn Thuận

From the study of an SU(2) gauge filed coupled to a massless scalar filed, when the spatial component of the gauge field equals zero, we have found solutions for the corresponding Yang – Mills equations. Nonabelian electric field of our solutions decreases $\tilde{r}3$, differ from classical electromagnetic formalism. This see that, SU(2) color charge of our solutions at source screened. The energy of the gauge and scalar field confiqurations of our solutions is less than that of the corresponding generalized electromagnetic field configuration when the color charge (Công Thức)

Người trình bày: **Nguyễn Văn Thuận**

22. Search for High Energy Skimming Neutrinos at a Surface Detector Array

Võ Văn Thuận, Hoàng Văn Khanh

Along with the charged extremely high energy cosmic rays (EHECRs), the Pierre Auger Observatory (PAO) is able to detect very high energy neutrinos and the most perspective channel is searching by the Cherenkov surface detector array (SD) for skimming tau-neutrinos at energies from 0.2 to 20 EeV just below the region of Greisen-Zatsepin-Kuzmin (GZK) cut-off [1]. This detection window is available due to the specific decays in flight of tau-leptons which produce very inclined airshowers at low altitudes above the SD array. Another combined technique at PAO, the fluorescent detector telescopes (FD), is much less effective for neutrino

detection [2]. In searching for additional detection channels including muon neutrinos, we consider the transition effects of residual radiation of direct pair production and bremsstrahlung or photonuclear reaction induced by skimming heavy charged leptons at a Cherenkov SD array, such as the operating Southern PAO or the future Auger Nord Project. An estimation applied to a model spherical earth surface shows a moderate effect of inclined electromagnetic showers for triggering neighbouring local Cherenkov SD stations. The covering effective energy range is below the GZK cut-off region. The accidental coincidences and other sources of systematic uncertainties are discussed and the identification criteria are proposed. A further attempt for realistic detection of skimming neutrinos should include detailed topographic conditions of a given SD array. This study is funded by the MOST of Vietnam for 2008-2009.

[1] J.Abraham et al., Pierre Auger Collaboration, Physiscal Review Letters, 100(2008)211101.

[2] D.Gora, M.Roth, A.Tamburro, Astroparticle Physics 26(2007)402.

Người trình bày: **Võ Văn Thuận**

23. The deformed crystal lattice vibration of kind difference atomic string and statistics of this vibration.

Nguyễn Thị Hà Loan, Đỗ Thị Thu Thủy, Vũ Quốc Hùng

We construct a q - deformed crystal lattice vibration for kind difference atomic string, consider an energy spectrum and a statistical distribution of this vibration.

Người trình bày: **Đỗ Thị Thu Thủy**

24. Khảo Sát Trạng Thái Tĩnh Của Chùm Electron Trong Đi-ốt Và Trong Không Gian Trôi

Nguyễn Minh Tuấn, Koval. T.V

Trong những năm gần đây quá trình phát sinh và lan truyền các chùm hạt mang điện cường độ cao được đặc biệt quan tâm. Các dạng chùm hạt này được ứng dụng rộng rãi trong vật lý plasma, trong các phương pháp tổng hợp gia tốc hạt, quá trình phát sinh sóng siêu cao tần ... và trong cả những thiết bị công nghiệp, dân dụng.

Mục đích công việc là nghiên cứu trạng thái tĩnh của chùm hạt electron trong đi-ốt và trong không gian trôi, đồng thời xác định những ảnh hưởng của kích cỡ giới hạn của chùm hạt và của hệ lên mật độ dòng hạt. Nhiệm vụ công việc là thu nhận các phương trình lý thuyết xác định cường độ giới hạn của chùm hạt trong miền trôi, trong đi-ốt dạng phẳng và dạng đồng trụ; đưa ra các phương trình mô tả chuyển động của các electron trong đi-ốt và trong miền trôi. Có một hạn chế là các công thức lý thuyết chỉ thu được trong các trường hợp đặc biệt và chỉ dùng để tính gần đúng hay ước lượng các giá trị cường độ dòng hạt. Trong bài này chương trình Comsol Multiphysics sẽ được sử dụng để tạo các mô hình trên máy tính cho phép tính toán chính

xác cường độ dòng hạt trong các hệ thống thực tế, đồng thời khảo sát sự ảnh hưởng của các kích thước của hệ thống, sự ảnh hưởng của môi trường và vật liệu lên sự phân bố trường điện từ trong đi-ốt và trong miền trôi.

Người trình bày: **Nguyễn Minh Tuấn**

II. VẬT LÝ CÁC MÔI TRƯỜNG ĐÔNG ĐẶC, HỆ THẤP CHIỀU, CẤU TRÚC NANO

25. Molecular Imaging with Ultra-Short Laser Pulses Using High Harmonic Generation

Lê Văn Hoàng

We review one of the hottest topics of Atto-second Physics in the last few years: How to image an atom/molecule by ultra-short intense lasers. The infrared lasers of durations of tens to sub-en femtoseconds are available that gives a strong instrument for molecular imaging. When an atom/molecule is exposed to an intense laser pulse, a non-linear effect occurs with the emission of high-order harmonics (HHG). The last contain information on the structure of the atom/molecule that can be extracted by using invert procedures such as the tomographic one. Canadian group obtained first dynamic 'photography' of N2 molecule in 2004 that generated a lot of interest of scientists. We will report our theoretical investigation in this direction and some results about molecular imaging.

Người trình bày: **Lê Văn Hoàng**

26. The Nonlinear Absorption Coefficient of a Strong Electromagnetic Wave by Confined Electrons in Cylindrical Quantum Wires with Parabolic Potential

Hoàng Đình Triển, Nguyễn Quang Báu

Analytic expressions for the nonlinear absorption coefficient of a strong electromagnetic wave by confined electrons in cylindrical quantum wires with parabolic potential are calculated by using the quantum kinetic equation for electrons in two cases: electron-optical phonon scattering and electron-acoustic phonon scattering. The dependence of the nonlinear absorption coefficient on the intensity E0 and frequency Ω of the external strong electromagnetic wave, the temperature T of the system, the radius R of wire is obtained. The analytic expressions are numerically calculated and discussed for GaAs/GaAsAl quantum wires. The results are compared with those for the normal bulk semiconductors and quantum well to show the difference.

Người trình bày: **Nguyễn Quang Báu**

27. Lo-Phonon-Limited Electron Mobility in a Polar Semiconductor Quantum Wire

Nguyễn Như Đạt

A macroscopic continuum model is used to study the longitudinal optical phonons in a polar semiconductor quantum wire with circular cross section. The Fröhlich Hamiltonian describing the electron-phonon interaction is then obtained and used to calculate the electron mobility governed by confined LO phonons by means of the memory function approach, including the many-particle effect in the RPA framework. The difference in the background dielectric constant of the wire and the barrier material is taken into account. Numerical calculations are given for a GaAs/GaAlAs quantum wire.

Người trình bày: **Nguyễn Như Đạt**

28. Mobility Enhancement In Square Quantum well: Symmetric Modulation of Envelop Wave Function

Trần Thị Hải, Nguyễn Trung Hồng, Nguyễn Huyền Tụng, Đoàn Nhật Quang

We present a theoretical study of the effects from symmetric modulation of the envelop wave function on quantum transport in square quantum well (QWs). Within the variational approach, we obtain analytic expressions for the carrier distribution and their scattering in double-side doped square QWs. Scattering by surface roughness and misfit deformation potential are found significantly weaker than those in the reference single-side doped sample. Thus, symmetric modulation of the wave-function is proposed as an efficient method for mobility enhancement in square QWs. The optimization of the conductivity is discussed. Our theory is successful in explaining the recent experimental data about transport properties, e.g., the mobility dependence on the channel width.

Người trình bày: **Trần Thị Hải**

29. Phase Transition in Binary Mixture of Bose Gases

Trần Hữu Phát, Lê Viết Hòa, Nguyễn Tuấn Anh, Nguyễn Văn Long

Based on the Cornwall-Jackiw-Tomboulis (CJT) effective action approach a theoretical formalism is established for studying the Bose-Einstein

condensation (BEC) in a binary mixture of Bose gases. The effective potential, which preserves the Goldstone theorem, is found in the Hartree-Fock (HF) approximation. This quantity is then used to consider the equation of state (EOS) and the phase transition of the system.

Người trình bày: **Lê Viết Hòa**

30. Electronic band structure of Graphene Superlattices

Phạm Công Huy, Nguyễn Hải Châu

Electronic band structure of graphene superlattices with a Kronig-Penney-like potential has been in details analyzed. Using the T-matrix approach, we derived the expression of energy as a function of the wavevector and studied the dependence of the miniband structure on the other parameters. The anisotropic behaviors of massless Dirac fermions are investigated. The group velocity is anisotropically renormalized, while it is unchanged at all for states with wavevector in one direction but is reduced to zero in another. This implies several useful applications in nanoscale electronic devides. We also showed that new Dirac points are generated and demonstrated that the number of them is controlled by the strength and period of potential which has dramatic consequences on electronic properties of system.

Người trình bày: **Phạm Công Huy**

31. Electroluminescence from intersubband cavity polariton states in the mid-infrared domain.

PiereJouy

trong coupling appears when photons are confined with an electronic transition of the same energy. In this regime, the energy diagram is strongly modified and replaced by polariton states dispersion. We recently demonstrated Electric-field tunable electroluminescence from intersubband transitions in a quantum well via the strong coupling of the electronic transitions with an optical cavity mode in the mid-infrared domain. The device consists of a quantum cascade structure embedded in a planar metal-dielectric microcavity where electrons can be resonantly injected at different energies, thanks to the polariton dispersion curve. The electroluminescence tuning shows a strong far field angular dependence in accordance with the conservation of the in-plane momentum. Our experiment illustrates that it is possible to connect quantum optics and electronic transport in semiconductor heterostructures

Người trình bày: **Piere Jouy**

32. Improved light trapping in silicon nanowire solar cells

Benedict O' Donnell

Concerns over the sustainability of our current methods for generating electricity are spurring the development of photovoltaic solar energy conversion. Most solar panels sold today are made from high purity crystalline silicon, making them expensive compared to conventional energy sources. Over the past thirty years, research on thin-films has brought a new generation of photovoltaic cells, made

from abundant materials and compatible with economic manufacturing processes, to commercial maturity. Although these devices are cheaper than their crystalline silicon predecessors, they are usually also less efficient.
In our research, we design nano-engineered materials that will improve energy conversion efficiencies while retaining thin-film manufacturing costs. We propose to boost the light trapping within thin-film silicon solar cells by exploiting the adjustable aspect ratio of silicon nanowires.
Batches of doped silicon nanowires are grown via plasma enhanced VLS and coated in silicon so as to produce a PIN junction. The catalysts for the nanowire's growth are produced by reducing with a hydrogen plasma the transparent conducting oxide layer on a standard PV industry SnO2 substrate. By adapting the nanowires' length and thickness, we exert control over the cell's texturing. This leads to promising light trapping effects, achieved in a single-pump down process.
Working devices are reported with open circuit voltages as high as 0,80V. We present their I(V) characteristics and spectral response curves and discuss some of the recombination paths that may currently be limiting the performance of these cells. We also explore further opportunities offered by silicon nanowires in terms of developing photovoltaics, including enhancing carrier collection and extending the absorption spectrum of thin film silicon solar cells.
Người trình bày: **Benedict O'Donnell**

33. Optical Transition Linewidths due to Piezoelectric Phonon Scattering in Doped Semiconductor Superlattices

Trần Công Phong, Nguyễn Thị Lệ Thủy, Võ Thành Lâm, Lương Văn Tùng

Utilizing the optical transition formula derived by the state-dependent projection method on the nonlinear response scheme, we obtain the optical transition linewidths for the electron system in doped semiconductor superlattices due to piezoelectric phonon scattering. We find the dependence of the widths on the temperature, the period of the superlattice, and the doped concentration of the n-doping and p-doping layer in the respective layers. The present results for doped semiconductor superlattices are compared to those of quantum wells.

Người trình bày: **Trần Công Phong**

34. Spectroscopy of an InAs/GaAs single quantum dot in a crystal photonic cavity

Nguyễn Hải Sơn

Semiconductor quantum dots are the artificial nanostructures where the electrons tri-dimension confinement produces a discreet energy spectrum as in the atom systems. In consequence, a single quantum dot can be considered a single photon emitter. Recent technology permits us to integrate a single quantum dot into a high quality micro-cavity. This achievement

brings back a classical picture of atomic physics: a photon emitter in an electro-dynamic cavity.

Our project target is to develop a single photon switch based on "photon blockade" effect. We study the coupling of an InAs/GaAs single quantum dot with a photonic crystal membrane cavity. Thanks to a very high quality factor and a small efficient volume of our photonic crystal cavity, a strong coupling can attend. This strong coupling leads to a quantum effect called "photon blockade" which is an optical analogy of Coulomb blockade in metal or semiconductor nanostructures at low temperature.

Người trình bày: **Nguyễn Hải Sơn**

35. Theory For Magnetic Orders in Thin Films

Bạch Thành Công, Phạm Hương Thảo, Nguyễn Tiến Cường

Existence of long range magnetic orders in low dimension systems (thin films, quantum dots, quantum wires) has attracted much attention of researchers at present time. In this research we calculated thermodynamic properties of a magnetic thin film using the Heisenberg localized spin model and functional integral method. It was shown that, the thermodynamic parameters of long range magnetic order like: magnetization, Curie temperature, susceptibility … strongly depend on the film thickness (the size of the system). These theoretical results are in good agreement with recent experiment data given in literature.

Người trình bày: **Phạm Hương Thảo**

36. Electron Scatterings Due To The Charge Fluctuations In Roughened O-Polar Face Of ZnO Surface Quantum Wells

Lê Tuấn, Nguyễn Thành Tiên, Trần Thị An, Đoàn Nhật Quang

We present a theoretical study of roughness-related scattering mechanisms for electrons in single heterostructures, especialy in Gaussian-doped ZnO surface quantum wells. We show that besides the conventional scatterings there must exist roughness-related mechanisms of charge origin, which stem from fluctuations in the donor density in the bulk ZnO and those in the distribution of spontaneous polarization charges on the O-polar ZnO surface. The role of spontaneous polarization is two-fold, as a confining source along the quantization direction but also as a scattering source in the in-plane. The strength of the two charge-origin scattering sources is found to be comparable with the one of the standard one from fluctuations in the barrier position. Comparison with the experimental results has been made. The effect of the dielectric discontinuity on the scattering mechanisms is discussed.

Người trình bày: **Lê Tuấn**

37. Coherence Kinetics of Condensed Microcavity Polaritons

Nguyễn Duy Vỹ, Cao Huy Thiện, Trần Thoại Duy Bảo

The second-order coherence of condensed microcavity polaritons is studied within Boltzmann-Master equations. Time evolution of g^2(0,t) in pulse excited GaAs microcavity is calculated for an initially empty ground state. Our average value of (g^2(0)) versus pump intensity agrees qualitatively with the measured average value in pulse excited GaAs microcavity obtained by Deng et al. (Science 298, 199 (2002)).

Người trình bày: **Nguyễn Duy Vỹ**

38. Van Der Waals and Casimir Interactions of some Graphene, Carbon Nanotube and Nanoparticale Systems

Phan Đức Anh, Quách Khả Quan, Trần Thanh Thúy, Vũ Thúy Hường, Ngô Văn Thanh, Nguyễn Ái Việt

The Van der Waals and Casimir interactions between graphene and a material plate, graphene and graphene plate, graphene and an atom or molecule are studied by using the Lifshitz theory. The reflection properties of electromagnetic oscillations on graphene are governed by specific boundary conditions imposed on the infinitely thin positively charged plasma sheet, carrying a continuous fluid with some mass and charge density. The obtained formulas are applied to the cases of a graphene interacting with Au nanoparticle, and graphene plates. We calculated also the Casimir interaction between two carbon nanotubes, and a single wall carbon nanotube with Au plate. The comparison with other recently obtained theoretical results are mad, and a generalizations to more complicated carbon nanostructures are discussed.

Người trình bày: **Phan Đức Anh**

39. Comparision of Two Techniques in Theory of Phonon-induced Cyclotron Resonance Linewidths for Quantum Wells

Trần Ngọc Bích, Trần Phan Thùy Linh, Trương Thị Hồng Nhung, Trần Công Phong

Using two different projection operator techniques, which are the Isolation-Projection Technique and the State-Independent Projection Technique for investigating cyclotron resonance in quantum wells, we obtain the analytical expressions of absorption. Using computational program we draw the graphs showing the dependence of absorption powers on the amplitude of magnetic field for different temperature and well's parameters. Then, line-widths are obtained as the profile of the curves of graphs. The results show that the splittings of cyclotron resonant peaks in two projection operator techniques are equivalent for quantum wells.

Người trình bày: **Trần Ngọc Bích**

40. The Reflection and Transmission of the Electromagnetic Wave in Multilayers Structures Composed from Cholesteric Liquid Crystals

Phó Thị Nguyệt Hằng, Phạm Thùy Dung, Nguyễn Hữu Hải

This paper deals with the problem of transmission for the electromagnetic wave in cholesteric liquid crystals. In case of incident beam perpendicular to the surface of the cholesteric liquid crystal layer, the analytical expressions for the characteristic matrix of the layer has

been derived, by which the problems of reflection and transmission for the electromagnetic wave in multilayers structures composed from cholesteric liquid crystals have been solved emphasising in the repeated reflection on the space between layers. Further, dependence of the reflection spectrum on the polarization of the incident beam are determined when the incident beam perpendicular to the surface of multilayers structures composed from fourteen layers which consists of consecutive one-by-one components, one from cholesteric liquid crystal layers, other from dielectric layers. Moreover dependence of the polarization of the reflection wave and the transmission wave on wavelength are obtained when the incident beam is in quadrature with system of the cholesteric liquid crystal putting on an isotropic dielectric layer.

Người trình bày: **Phạm Thùy Dung**

41. The Channel-Width Dependence Of The Low-Temperature Hole Mobility In Ge-rich Narrow Square Quantum Well Studied by the Band-bending Method

Trần Thị Hải, Nguyễn Trung Hồng, Nguyễn Huyền Tụng, Đoàn Nhật Quang

We employ the theory of band-bending effects to explain the channel-width dependence of the mobility of a two-dimentional hole gas (2DHG) in narrow square Si/Si¬1-xGex/Si quantum well at high Ge content. The numerical calculation of scattering mechnisms is shown in comparision with the one from the previous

computation. As a result. Our method enables a beter quantitative description of recently measured data about the dependence of the 8 K mobility of holes in a Si/Si¬0.2Ge0.8/Si quantum well on the channel width varying from 25-70A.

Người trình bày: **Trần Thị Hải**

42. Electron-Phonon Resonance and Absorption Line-widths in Quantum Wires

Lê Đình, Nguyễn Đình Hiên, Lê Văn Hưng, Trần Công Phong

Electrophonon resonance (EPR) and optical detected electrophonon resonance (ODEPR) effects are investigated in rectangular and cylindrical quantum wires using the projection operator technique. We obtain the analytical expressions and graphs of absorption power. From graphs of the absorption power we obtain linewidths as profile of curves. By considering the dependence of shift of absorption peaks in the case of electron –phonon resonance on the frequency of incident photon we determine the conditions of ODEPR. The dependence of these conditions on temperature, wire's parameters has been analyzed. A comparison between effects occurring in the two types of wire has been also considered.

Người trình bày: **Nguyễn Đình Hiên**

43. The Nonlinear Acoustoelectric Effect in a Superlattice

Nguyễn Quang Báu, Nguyễn Văn Hiếu, Nguyễn Thị Thúy, Trần Công Phong

The acoustoelectric effect in a superlattice (SL) is investigated for an acoustic wave whose wavelength =/q is smaller than the mean free path l of the electrons and hypersound in the region ql. (where q is the acoustic wave number). A nonlinear dependence of the acoustoelectric current jac on the constant electric field E is obtained by using classical kinetic Boltzman's equation. Caculated in the case relaxation time of momentum is constant approximation. Numerical caculations is done, and the result is discussed for a typical GaAs/AlAs SL. It is noted that when the electric field is negative the current jac falls, reaches a minimum and rises. On the other hand, when the electric field is positive the current increases, reaches a maximum and then falls off. A similar observation has been noted acoustoelectric interaction in a multilayered structure resulting from the analysis of Si/SiO2 structure. The dominant mechanism for such a behavior is attributed to the periodicity of the energy spectrum of electron along the SL axis.

Người trình bày: **Nguyễn Văn Hiếu**

44. Generalization of the Dirac and Yang Monopoles to a 9-Dimensional Space – a Non-Abelian SO(8) Monopole

Lê Văn Hoàng, Phan Ngọc Hưng, Nguyễn Lê Đăng

We generalize the Dirac and Yang monopoles to a 9-dimensional space and have found that it is a non-Abelian SO(8) monopole. The explicit form of the monopole vector potential is given and the bound system composed of the found monopole coupled to a particle by the SO(8) and Coulomb interaction is considered. We have found also that the system has the SO(10,2) dynamical symmetry.

Người trình bày: **Lê Văn Hoàng**

45. Magneto-phonon Resonance in Quantum Wells with Parabolic Potential

Bùi Đình Hợi, Trần Công Phong, Võ Thành Lâm

The linear dc magneto-conductivity parallel to the walls of a parabolic quantum well, with a magnetic field $\bold{B}=B \hat{z}$ applied normal to its barriers, is evaluated for electron – optical phonon interaction. For optical and polar optical phonons, the magneto-conductivity oscillates as a function of the magnetic field with resonances occuring when $P \omega_c = \omega_0$, where ω_c, ω_0 are cyclotron and optical phonon frequencies, respectively, and where P is an integer. The analytic results are numerically evaluated to show explicitly the dependence of magneto-conductivity on the magnetic field, the confinement frequency, and the temperature of the system.

Người trình bày: **Bùi Đình Hợi**

46. The Effect of Confined Phonons on the Nonlinear Absorption Coefficient of a Strong

Electromagnetic Wave by Confined Electrons in Compositional Superlattices and Doped Superlattices

Lê Thái Hưng, Nguyễn Đức Thắng, Nguyễn Thị Hà Thu, Nguyễn Vũ Nhân, Nguyễn Quang Báu

The effect of confined phonons on the nonlinear absorption coefficient of a strong electromagnetic wave by confined electrons in compositional superlattices and doped superlattices are theoretically studied by using the quantum transport equation for electrons. The dependence of the absorption coefficient on the frequency (Ω), the amplitude (E_0) of external strong electromagnetic wave, the temperature (T) of the system, doping concentration (n_D) of doped superlattices and the period (d) of compositional superlattices is obtained. Two cases for the absorption: Close to the absorption threshold $| k \hbar \Omega_0 | \ll \bar{\epsilon}$ and far away from the absorption threshold $ | k \hbar \Omega_0 | \gg \bar{\epsilon}$ ($k = 0,\pm 1,\pm 2,...$; $\hbar \omega_0$ and $\bar{\epsilon}$ and $ε$ are the frequency of optical phonon and the average energy of electron, respectively) are considered. The formula of the nonlinear absorption coefficient contains a quantum number m characterizing confined phonons. The analytic expressions are numerically evaluated, plotted and discussed for a specific of the $GaAs-Al_{0.3}Ga_{0.7}As$ compositional superlattices and $n-GaAs/p-GaAs$ doped superlattices. There are more resonant peaks of the absorption coefficient appear and

the values of the absorption coefficient are much larger than they are in case of unconfined phonons.

Người trình bày: **Lê Thái Hưng**

47. Ph-Dependence of the Optical Bio-Sensor Based on Dna - Carbon Nanotube

Vũ Thúy Hường, Quách Khả Quang, Trần Thanh Thúy, Phan Đức Anh, Ngô Văn Thanh, Nguyễn Ái Việt

The pH-dependent behavior of the new type of optical bio-sensors, based on DNA-wrapped CNNTs, was investigated. The theoretical model was developed in the frame work of exciton theory in CNNTs and structure phase transition of DNAs from the right-handed B form to the left-handed

Z form. Using the experimental obtained pH-dependence of its two basic elements: DNA and carbon nanotube, the pH-dependence of this type of

optical bio-sensors was predicted. The good working range was found from pH 6 to 9 and the concentration of measured harmful ions should be more than the critical value. Our theoretical results were according to the experimental data and deduction of pH and salt concentration in solutions

Người trình bày: **Vũ Thúy Hường**

48. Magneton-Phonon Resonance Line-width in Quantum Wells

Võ Thành Lâm, Trần Công Phong, Bùi Đình Hợi

Using the projection operator technique we obtain the analytical expression of optical conductivity and absorption power in the case of magnetophonon resonance in quantum wells. Using computational program we draw the graph showing the dependence of the absorption power on magnetic field, the frequency of incident photon for different temperature and well's parameters. Then, line-widths are obtained as the profile of the curves of graphs. The results show that the splitting of resonant peaks in the presence of laser field can be used for detection of magnetophonon resonance in the quantum wells.

Người trình bày: **Võ Thành Lâm**

49. Hatree – Fock – Bogoliubov Approximation in Functional Integral Formalism

Nguyễn Trí Lân

Hatree – Fock – Bogoliubov approximation is obtained within framework of Hubbard – Stratonovich transformation. The present approach allows for an ability of investigating the coexistence of different phases in several heavy fermion materials such as coexistence of ferromagnetism and superconductivity in U - compounds.

Người trình bày: **Nguyễn Trí Lân**

50. Resistance and shot noise of Graphene n – p – n junctions

Phan Thị Kim Loan, Nguyễn Hải Châu, Trần Nguyên Dũng

Using the T – matrix approach, we computed theoretically resistance and shot noise in model of Graphene n – p – n junctions. In this report, transport properties were calculated in both fully and partly ballistic regimes. Obtained results of the odd-part resistance as a function of gate voltage were good agreement with the experimental data and semi – classical picture represented by B. Huard et al. (PRL 98, 236803, 2008). We also described the numerical result for Fano – factor of the system as a function of Fermi – level of the graphene sheet.

Người trình bày: **Phan Thị Kim Loan**

51. The complex states of many-particle correlations in quasi -two-dimentional semiconductor nanostructures

Dương Xuân Long, Hoàng Ngọc Cầm

We study the complex states of two-exctions in ultrafast nonlinear optical response of quasi -two-dimentional semiconductor nanostructures. The interactions in the system are modeled through Morse potentials and power function potentials. We show analytically the energy and wave function of biexcitons at zero-momentum. The scattering states and their effects are investigated

Người trình bày: **Dương Xuân Long**

52. Piezoelectric Effect on the Electron Mobility in an Unintentionally Doped GaN/AlGaN Surface Quantum Well

Nguyễn Viết Minh

We present a theoretical study the two-dimensional electron gas 2DEG at low temperature in an unintentionally doped GaN/AlGaN surface quantum well, taking adequate account of the roughness-induced scattering mechansms and effect due to sheet polarization charges. Within model of surface quantum wells describes by an extended Fang-Howard wave function, we are able to derive an analytic expression for the self-consistent Hartree potential. Thus, we obtained simple expresion describing the enhancement of the 2DEG screening and unscreened potentials for diffent scattering sources. We studied the piezoelectric effect on the electron mobility in an unintentionally doped GaN/AlGaN surface quantum well

Người trình bày: **Nguyễn Viết Minh**

53. Some Thermal Properties of the Fermionized Heisenberg Antiferromagnet on the Triangular Lattice

Trần Văn Quảng, Phạm Thị Thanh Nga, Nguyễn Toàn Thắng

We have analyzed the spin ½ isotropic Heisenberg antiferromagnetic system on the triangular lattice within Popov-Fedotov functional integral formalism when the spin operators are reprensented by the

fermionic ones and the constraint of single occupancy conditions is taken into account by introducing an imaginary chemical potential. By expanding around a state with local 1200 order we compute the one-loop corrections to the free energy and discuss some thermal properties.

Người trình bày: **Phạm Thị Thanh Nga**

54. The Acoustomagnetoelectric Effect in Quantum Wires

Nguyễn Văn Nghĩa, Nguyễn Vũ Nhân, Nguyễn Quang Báu

The acoustomagnetoelectric (AME) effect in cylinder quantum wire with infinite potential has been investigated for an acoustic wave whose wavelength λ = 2π/ is smaller than the mean free path l of the electrons and hypersound in the region ql >> 1, (where is the acoustic wave vector). The analytic expression for the AME current j^AME is calculated in the case: relaxation time of momentum τ is constant approximation and degenerates electrons gas. The nonlinear dependence of the expression for the AME current j^AME on acoustic wave numbers q and the negative AME current j^AME have been shown. Numerical computations and graphs are performed for AlGaAs/GaAs quantum wire. We have obtained the curve of the AME current j^AME strongly decreases following acoustic wave numbers q. The results have been compared with the normal bulk semiconductors to show the conformity with the image of the AME current

j^AME in the normal bulk semiconductors, but the values of the AME current j^AME in quantum wire are smaller than they are in the normal bulk semiconductors.

Người trình bày: **Nguyễn Văn Nghĩa**

55. Total Diffraction Reflection of Polarized Neutrons by Crystal Surface With Polarized Nucleus, Placed in Periodical Variable Magnetic Field

Hoàng Văn Ngọc, Nguyễn Đình Dũng

In this article the differential cross-section of total diffraction reflection of polarized neutrons by crystal surface with polarized nucleus placed in periodical variable magnetic field are obtained and discussed.

Người trình bày: **Hoàng Văn Ngọc**

56. Combined studies of cell response to electric pulses: A simple approach.

Nguyễn Thị Thùy Nhung, Lê Thanh Tùng, Nguyễn Đức Giang, Ngô Văn Thanh, Nguyễn Ái Việt

*Using the analytical calculations for the interaction between trapezoidal pulses and biological membranes [Kotnik et al, Biophys J. 2006, **90**(2), 480-491] and the approximate theory for pore creation and pore current [DeBruin et al, Biophysical Journal, **77**, 3, 1999, 1213-1224], in this work, we have studied the effects of electric pulses on the cell responses, including the electroporation phenomenon. We investigated the dependance of membrane potentials of outer (plasma) and inner (organelle) membranes, the membrane*

currents and pore densities on the electric pulses. Our approach can be applied to target the inner membrane, making the cell selectivity available or developed to more complex structures (triple cell model, the mitochondria, for example). Our results are in very good agreement with previous numerical calculations.

Người trình bày: **Nguyễn Thị Thùy Nhung**

57. Calculation of the Optical Absorption Power in Rectangular Quantum Wire by Using State-Independent Projection Technique

Huỳnh Vĩnh Phúc, Lê Thị Thu Phương, Trần Công Phong

Linear and nonlinear optical absorption power in rectangular quantum are calculated by using state-independent projection technique. The analytical experessions for the optical absorption power in rectangular quantum wires are obtained. The numerical result for the dependence of the optical absorption power on its energy as systems temperature T and the parameters charactering the sample have been done.

Người trình bày: **Huỳnh Vĩnh Phúc**

58. Nonlinear Optical Absorption of Intensity Terahertz Radiation by Confined Electrons in Cylindrical Quantum Wires

Lê Thị Thu Phương, Huỳnh Vĩnh Phúc, Lê Đình, Trần Công Phong

Analytic expressions for the optical absorption coefficient of intensity terahertz (THz) radiation caused by confined

electrons in cylindrical quantum wires (CQW) are calculated by using the quantum kinetic equation for electrons for both scattering mechanisms of the electron–optical phonon and electron-acoustic phonon. Second-order multiphoton process is included into present account. The dependence of the absorption coefficient on the intensity E0 and the frequency Ω of the THz radiation, the temperature T of the system, and the radius R of CQW is numerically evaluated and plotted for a specific quantum wire. The numerical results for two scattering mechanisms are compared at one another. Their similarities and differences are discussed.

Người trình bày: **Lê Thị Thu Phương**

59. Secondary electrons production in the ionization of tissue by ion beams and their DNA-damage

Ngô Thị Thu Phương, Nguyễn Thị Thương, Ngô Văn Thanh, Nguyễn Ái Việt

At present, ion beam cancer therapy is widely use treatment tool. Due to the complexity of ion-tissue interaction, the mechanisms and biological effects of ion beams can not be unambigously explained and remain unclear. Most research interests have focused on DNA, wich contains genetic information and can influence the phenotype of an organism. In the last years a new nanoscale aproach is developed based on the mechanism of ion-induced electron production in the tissue-like media and their DNA-damage. In this work, to estimate the DNA damage by ion beams, instead of 10-parameters model of Esurdutovich et al 2008 [1] we suggested a simpler 7-parameters model for interaction between

carbon ion beams with water molecules, the major content of living tissue. Numerical estimate is performed for the case of carbon ion beams. Our obtained dose-depth curves are comared with results of [1].

Người trình bày: **Ngô Thị Thu Phương**

60. Nghiên cứu năng lượng tương quan đối với exciton tích điện trong chấm lượng tử 2 chiều

Nguyễn Minh Thảo, Nguyễn Hồng Quang

Nghiên cứu bài toán exciton tích điện trong chấm lượng tử hai chiều có thế giam cầm dạng parabol bằng mô hình Hartree-Fock có kể đến hiệu ứng tương quan giữa các điện tử. Năng lượng tương quan được xác định như là sai số giữa năng lượng chính xác và năng lượng thu được trong mô hình Hartree-Fock. Để tính năng lượng tương quan chúng tôi sử dụng phương pháp tương tác cấu hình (Configuration Interaction – CI) và giới hạn ở các kích thích đơn hạt. Đã tính và khảo sát ảnh hưởng của độ giam cầm lên năng lượng tương quan. Kết quả tính số cho chấm lượng tử GaAs cho thấy ảnh hưởng không nhỏ của năng lượng tương quan đối với phổ hấp thụ của exciton tích điện, đặc biệt đối với các trạng thái kích thích.

Người trình bày: **Nguyễn Minh Thảo**

61. Polariton Parametric Amplification in Semiconductor Microcavity Investigated with a Boltzmann Approach

Lê Nguyễn Minh Thông, Cao Huy Thiện

Within the approach of Boltzmann kinetic equation, we investigated interaction between polaritons in microcavity. Under resonant optical excitation, this scattering process resulted in concentration Polaritons on not only the ground state, known as Bose-Einstein Condensation, but also a excited state. Our calculated results are in agreement with experimental results of Savvidis et al.

Người trình bày: **Lê Nguyễn Minh Thông**

62. Model of Subdiffusion Within Flavin Reductase Protein with Morse Potential

Nguyễn Thị Thương, Ngô Thị Thu Phương, Ngô Văn Thanh, Nguyễn Ái Việt

Some phenomenon observed in recent nanoscale single-molecule biophysics experiments is subdiffusion, which largely departs from the classical Brownian diffusion theory. To explain this subdiffusion phenomenon, a theoretical model is formulated in the work of Kou et al 2008 and the taken potential was parabolic. In this work we investigate the Kou model with Morse potential for the case of flavin reductase protein. By applying Morse potential, we found a better agreement with experimental data then using parabolic potential.

Người trình bày: **Nguyễn Thị Thương**

III. VẬT LÝ THỐNG KÊ, TINH THỂ KIM LOẠI, HỢP KIM

63. The Pressure Dependence of EXAFS Debye-Waller Factors in Crystals

Vũ Văn Hùng, Hồ Khắc Hiếu, Nguyễn Văn Hùng

In present article, the pressure dependence of Debye-Waller factors in crystals have been investigated by using statistical moment method (SMM). The present SMM calculations indicate that the Debye-Waller factors of crystals decreases slightly under high pressure. Our results are also compared with other calculations and experiment and are found to be in goo agreement with these results.

Người trình bày: **Hồ Khắc Hiếu**

64. Study of Structural Phase Transformation and Melting Temperature of Metals: Pressure Dependence

Vũ Văn Hùng, Đặng Thanh Hải, Hoàng Văn Tích

The melting temperature and phase transformation of metals are studied using the statistical moment method, going the quasi-harmonic appromations. The melting and phase transition temperatures of metals are calculated as a function of the pressure. We discuss the pressure dependence of these temperatures of Ce, Dy, Fe, Ti metals and compare the present results with those of the experimental results.

Người trình bày: **Đặng Thanh Hải**

65. Study of Thermodynamic properties and self-diffusion of AuCu Superlattice

Vũ Văn Hùng, Nguyễn Thị Hằng, Cao Huy Phương

We have investigated the self-diffusion and thermodynamic quantities of AuCu superlattice using thestatistical moment method in the statistical physics. The activation energy, diffusion coefficient, pre-exponential factor, lattice parameter, thermal axpansion coefficient, ete.., are dirived in closed analytic forms, The present analytic formulas including the anharmonic effects of the lattice vibrations give the predicted values of these quantities.

Người trình bày: **Nguyễn Thị Hằng**

66. Study of Elastuc Moduli of Interstitial Alloys by Statistical Moment Mothed: Temperature Dependence

Vũ Văn Hùng, Nguyễn Thị Thu Hiền

The elastic moduli of the interstitial alloys at finite tempertature have been investigated using the statistical moment method. The Young, shear and bulk moduli of the body-centered cubic (bcc) interstitial alloys like Fe-X alloys (X=H, N, Li and Si) are calculated as a function of the temperature. We discuss the temperature dependence of the elastic moduli, E, G and K of the interstitial alloys and compare our calculated results with those of the experimental results.

Người trình bày: **Nguyễn Thị Thu Hiền**

67. Influence of Temperature on Self Diffusion in GaAs Crystal

Vũ Văn Hùng, Phan Thị Thanh Hồng, Nguyễn Thanh Hải

By using the statistical moment method (SMM) to investigate the self-diffusion of Ga and As atoms in GaAs with crystal structure as ZnS type, the activation energy (Q), diffusion coefficient (D) and pre-exponential factor (D0) are expressed by analytically closed expressions. The present analytical formulas are including the anharmonic effects of the lattice vibrations. The obtained results (Q, D, D0) are applied to numerical calculation. The calculated results are in agreement with experimental data.

Người trình bày: **Phan Thị Thanh Hồng**

68. Thermodynamic Property of Some Quantum Crystals under Pressure

Vũ Văn Hùng, Nguyễn Quang Học, Đinh Quang Vinh

Thermodynamic properties such as the the lattice constants, the thermal expansion coefficients,etc. of some quantum crystals (He, Ar, Xe, Ne) under pressure are determined by the Einstein correlational model and the statistical moment method and our calculated results are compared with the exparimental data.

Người trình bày: **Đinh Quang Vinh**

IV. VẬT LÝ LƯỢNG TỬ, QUANG LƯỢNG TỬ, THÔNG TIN LƯỢNG TỬ

69. Perspective Topics in Physics of Quantum Information

Nguyễn Văn Hiệu

Three actuals topics in physics of quantum information processing technology are discussed:

1. Quantum information exchange between two qubits.

2. Tensor representation of qubits and multiqubit systems.

3. Cluster states of multi-qubit systems.

The aim of this talk is to encourage the Conference participants to study these new and perspective problems of quantum information.

Người trình bày: **Nguyễn Văn Hiệu**

70. Quantum Information and Probability Description of Quantum States

Vladimir I. Man'ko

The new approach in quantum information, in which the quantum states of qubits and qudits are desrcribed by fair probability distributions, is reviewed. The quantum information channels and corresponding positive and completely positive maps of density operators are considered as classical-like information channels where information is propagating being coded by probability distributions. The new experiments to study bounds (quantum inequalities) in quantum information processing associated with quantum fluctuations are discussed for the case of purity parameters substantially different from the unity. Prospects for elaborating the applications of tomographic probability representation of quantum states and quantum channels in quantum information are presented.

Người trình bày: **Vladimir I. Man'ko**

71. Five-level Model For Cascade Scheme of EIT In Cold 85Rb Atoms

Đinh Xuân Khoa, Cao Long Vân, Vũ Ngọc Sáu, Nguyễn Huy Bằng

Schemes in electromagnetically induced transparency (EIT) which would support multiple-transparency windows are of interest, e.g., for slowing light pulses, simultaneously at close-lying wavelength. For this purpose a dense hfs structure of the 85Rb (5D5/2) state can be utilized in a stepwise 5S1/2(F = 3) -> 5P_3/2(F' = 3)<-> 5D_5/2 (F" = 4, 3, 2) process.

In this paper we extend the model proposed in. Calculations for spectra in MOT at various intensities Ic of the coupling laser are performed. Our results have been verified by experimental group in Warsaw

Người trình bày: **Đinh Xuân Khoa**

72. Explicit Construction of Cluster States of Systems of Two and Three Spin-Qubits

Lê Thị Hà Linh

Recently it was proposed to use a new class of entangled states of multi-qubit systems-the cluster states, as a tool in the quantum computation. In the present work, we derive explicit expressions of the cluster states of a two spin-qubit system, a three spin-qubit chain and a three spin-qubit ring. Explicit formulae of the time evolution of cluster states of above-mentioned systems of two and three spin-qubits with direct spin-spin couplings were also established. They are useful for study on the realization of the quantum gates in these systems.

Người trình bày: **Lê Thị Hà Linh**

73. New Entropic Bounds in Quantum Information Processing

Margarita A. Man'ko

The Shannon entropy and entropic uncertainty relations in quantum information processing are reviewed. The subadditivity and strong subadditivity conditions (inequalities) for joint tomographic probability distributions describing the multiqubit quantum states are presented. The deformed Renyi entropy associated with the multiqubit quantum states is introduced, in view of quantum spin tomograms of the multiqubit states. New entropic bounds are obtained for both the Shannon and Renyi tomographic entropies. The bounds are applied to the experiments of meauring

quantum states by homodyne photon detector and a new entropic uncertainty function depending on the local oscillator's phase is introduced. In quantum optics, the nonnegativity of the entropic uncertainty function is suggested to be checked as a measure of the accuracy of the homodyne photon detecting experiments as well as a check of the quantumness of information processing with Gaussian channels.

Người trình bày: **Margarita A. Man'ko**

74. Accurate Potential Energy Curve for The 31Π State of NaLi Molecule

Nguyễn Huy Bằng, Đinh Xuân Khoa, Lê Cảnh Trung, Trần Mạnh Cường

This paper presents construction of an accurate potential energy curve (PEC) for the 31Π state of NaLi molecule by means of the Inverted Perturbation Approach (IPA). In the framework of adiabatic approximation, the 31Π state is described by the radial Schrödinger equation in which the term for potential function to be determined. Having 380 spectral lines of the 31Π←11∑+ band obtained in our previous work [Chem. Phys. Lett, 440 (2007) 199-202], we use the semi-classical Rydberg-Klein-Rees (RKR) method to determine an approximate PEC. This RKR potential curve is then used as the trial one for the IPA method to search iteratively potential corrections in a way of minimizing energy differences between the calculated and observed level energies. After several iterations of the IPA procedure we obtain the final IPA potential

energy curve, which can reproduce the experimental data within dimensionless root mean of square deviation 0.6. We demonstrate a good agreement between Franck-Condon factors calculated from the IPA potential and the intensity distributions of the correspondingly observed spectral lines. Finally, comparison with the up-to-date theoretical results for NaLi, the IPA potential confirms reliability of recent ab initio calculations

Người trình bày: **Nguyễn Huy Bằng**

75. New Entanglement Criterion For Two-Mode States

Trương Minh Đức, Hoàng Phương Hà

In this paper, we derive a new entanglement criterion for two-mode states via generalizing the entanglement criteria of Hillery and Zubairy [Phys. Rev. Lett. 96, 050503 (2006)] by using the Cauchy – Schwarz inequalities and the separable and inseparable property of a density matrix given by Horodecki. After that, we apply this criterion to detecting entanglement for some two-mode states.

Người trình bày: **Hoàng Phương Hà**

76. Transmittance Function Of Two-ports Nolinear Fiber Mach-Zehnder Interferometer

Nguyễn Văn Hóa, Hồ Quang Quý, Nguyễn Thị Thanh Tâm, Vũ Ngọc Sáu

In this article a two-ports nonlinear fiber Mach-Zehnder interferometer is proposed. The expression for output-input intensity relation and the transmittance function are derived based on principle operation of optical coupler. The expression of coupling coefficient of coupler is presented. The bell shape of the transmittance function is simulated. The results lead to investigate bistability of two-ports- nonlinear fiber Mach-Zehnder interferometer and to confirm bistable character of it in the future.

Người trình bày: **Nguyễn Văn Hóa**

77. Generation of free-travelling four-mode cluster-type entangled coherent states

Nguyễn Bá Ân, Trần Thái Hòa

A new scheme is proposed to generate free-travelling four-mode cluster-type entangled coherent states. Compared with other previously proposed schemes ours is very simple in execution using only one ^{1}-cross-Kerr medium and two 50:50 beam-splitters each of which is sandwiched between two ^{1}/2-phase-shifters. Despite the setup simplicity, our scheme, unlike the others which are all probabilistic, is efficient with 100 % success probability since no measurements are involved at all

Người trình bày: **Trần Thái Hòa**

78. Entanglement Criterion for Bipartite Quantum States: Application

Trương Minh Đức, Nguyễn Thị Xuân Hoài

In this paper, we use the criterion provided by E. Shchukin and W. Vogel [Phys. Rev. Lett. 95, 230502 (2005)] for determining when a bipartite quantum state is entangled. We first show that the entanglement criterion is the necessary and sufficient condition for the partial transposition of bipartite quantum states. Furthermore, previously known entanglement criteria are proved to be special cases of this criterion. We then apply the entanglement criterion to determine entangled property of several non-classical two-mode states. Finally, we conclude by making remarks on applicability of this criterion.

Người trình bày: **Nguyễn Thị Xuân Hoài**

79. Density matrix of strongly coupled quantum dot microcavity system

Nguyễn Văn Hợp

Any two-level quantum system can be used as a quantum bit (qubit)-the basic element of all devices and systems for quantum information and quantum computation. Recently it was proposed to study the strongly coupled system consisting of a two-level quantum dot and a monoenergeti photon gas in a microcavity-the strongly coupled quantum dot-microcavity (QD-MC) system for short, with the Jaynes-Cumming total Hamiltonian, for the application in the quantum information processing. Different approximations were applied in the theoretical study of this system. In this work, on the basis of the exact solution of the Schrodinger equation for this system

without dissipation we derive the exact formulae for its density matrix. The realization of a qubit in this system is discussed. The solution of the system of rate equation for the strongly coupled QD-MC system in the presence of the interaction with the environment was also established in the first order approximation with respect to this interaction

Người trình bày: **Nguyễn Văn Hợp**

80. Higher-Order Squeezing and Antibunching of SUq(1,1) q-Coherent States

Trương Minh Đức, Trần Lê Hùng

We have studied the higher-order squeezing and the antibunching in SUq(1,1) q-coherent states. We obtained analytic forms of the degree of the higher-order squeezing and the antibunching. We show that the SUq(1,1) q-coherent states exhibit both higher-order squeezing, and also exhibit the antibunching behaviors. There are some different properties of the two types squeezing and the antibunching in SUq(1,1) q-coherent states given in the conclusion

Người trình bày: **Trần Lê Hùng**

81. Optical Soliton Propagation in Single Mode Optical Fibers in The Presence of Stimulated Raman Scattering

Thái Thị Minh Nguyệt, Vũ Ngọc Sáu, Nguyễn Huy Bằng

Propagation of femto-second or subfemto-second optical pulses in single mode fibers is of interest in optical communication because of its potential for high data rate transmission systems, especially when shapes of envelope of the pulses remain constants (solitons). In such short time regime, evolution of envelope of the pulses is described by the so called Generalized Schrödinger Equation (GNSE) which takes into account nonlinear effect as Self Phase Modulation (SPM), Group Velocity Dispersion (GVD), Third Order Dispersion (TOD), and Stimulated Raman Scattering (SRS). In this paper we search soliton solutions for the GNSE in the presence of all above nonlinear effects by use of Jacobian expansion. We find several ranges for the above nonlinear effects in which solitons propagation can be maintained.

Người trình bày: **Thái Thị Minh Nguyệt**

82. Investigation Of Wavelength Shifting In The DFB Laser With Two Sections By Using Injection Current I2 Into Saturable Absorber Section

Nguyễn Văn Phú, Đinh Văn Hoàng

In this paper we study of wavelength shifting in the DFB laser with two sections by using injection current I2 into the saturable absorber section. By using the injection current I2, we investigated the mode of laser generation of the DFB laser with two sections.

We found the suitable parameters for experimental procedure to application of the two sections DFB laser in the optical communication.

Người trình bày: **Nguyễn Văn Phú**

83. Matching of Pump and Mode volumes inside Laser Diodes side-pumped Laser Rod

Nguyễn Văn Hóa, Hồ Quang Quý, Vũ Ngọc Sáu

Mismatching of the pump volume and mode volume inside active rod is an important effect, which influences thermal effect, periodical induced refractive index, and then efficiency of laser generation. To avoid it, it needs to choice a optimal collection of basical parameters of pumping laser diodes and of cavity. By transfer matrix of optical elements and cavity theory, an equation discribed relation between transverse waist of pump intensity inside laser rod and waist of Gaussian mode TEM00 of laser cavity is adressed. Using simulation method, the optimal value of parameter is calculated and discussed. The results give us a suitable choice for experiments in the furture.

Người trình bày: **Hồ Quang Quý**

84. Four-level Model For EIT of Cold 85^Rb

Vũ Ngọc Sáu, B. Brzostowski, Cao Long Vân, Đinh Xuân Khoa, B. Grabiec

It is shown by theoretical model describing interaction of strong electromagnetic filed with four-level atomic system of cold 85Rb that a multiple windows of

electromagnetically induced transparency (EIT) occurs in the spectral profile of the profile absorption in the transition 5S_1/2 (F = 2, 3) <-> 5P_3/2 (F = 2, 3).

Our results are in good agreement with previous theoretical investigations. Obtained theoretical predictions will be compared soon with experimental observations of Warsaw's group.

Người trình bày: **Vũ Ngọc Sáu**

85. Quantum Dynamics of Spin-Qubits in a Spin-Star Environment

Hồ Công Sơn

The fundamental unit of all systems for the quantum information processing is qubit. Each microscopic spin-1/2 particle with non-vanishing magnetic moment can be used as a qubit called spin-qubit. In a solid containing ions with non-vanishing moments- a quantum spin environment, there always exists the interaction between qubits and this environment. Recently, exactly solvable models of a spin-qubit and two coupled spin-qubits interacting with a spin-star environment containing an infinite number of coupled nuclear spins in the thermodynamic equilibrium at a finite temperature are presented, in which all the spin-spin couplings are the XY Heisenberg interaction. In this study, basing a common simple method we derive the exact analytical expression of the elements of their total and reduced density matrices. The explicit

expressions of these elements are presented in some special cases with simplifying initial conditions

Người trình bày: **Hồ Công Sơn**

86. Quantum interference effects in resonance fluorescence spectra of Y- type four – level atom

Thái Doãn Thanh, Lê Văn Nam, Nguyễn Huy Công

In this paper we investigate the influence of quantum interference induced by spontaneous emission on the fluorescence spectrum of a laser driven four – level atom in Y-type configuration. For some parameters, interference assited enhancement of inner sideband and narrowing of central peaks may also accur in the fluorescence spectrum. We presents using the dressed state dsecription of the atom – light interaction

Người trình bày: **Thái Doãn Thanh**

87. The resonance fluorescence of a three-level atom in the presence of a squeezed broad-band vacuum and quantum interference

Thái Doãn Thanh, Lê Văn Nam, Nguyễn Huy Công

The resonance fluorescence spectrum (RFS) of a Υ-type three-level atom damped by a broad-band squeezed vacuum and driven by a single coherent field which simultaneously couples the two lower states are studied. Although the system has two lower states, quantum interference is possible because there are interfering pathways to each of the two lower states. The additional interference terms allow for interesting effects such as

the suppression of a dark state which is present without the interference. We consider the interplay between the squeezed field and the vacuum-induced coherence (VIC) between the two possible decay channels. Finally we examine a narrow spectral feature in the resonance fluorescence of the atom with quantum interference.

Người trình bày: **Thái Doãn Thanh**

V. VẬT LÝ TÍNH TOÁN, MÔ PHỎNG VÀ MÔ HÌNH HÓA

88. Ising spin glass on a FCC lattice: a Monte-Carlo simulation

Hoàng Đình Tiến, Ngô Văn Thanh, Nguyễn Ái Việt

We studied the Ising spin glass with bimodal interactions (±J) in dimension three (3D). The antiferromagnet FCC Ising model is fully frustrated and has a strong first-order transition if there is no disorder, it becomes spin glass when introducing a small interaction disorder P~ 0.03%. We first propose a new technique for calculating the magnetization and susceptibility from the order parameter Q.

Người trình bày: **Hoàng Đình Tiến**

89. Density - Functional Study of Magneto - Structural Correlation in Mn4 Molecules: A way to develop Single - Modecule Magnets

Nguyễn Anh Tuấn, Shin - Inchi Katayama, Dam Hieu Chi

Single-molecule magnet (SMM) is a molecule that can function as magnets below its blocking temperature (T_B). This behavior results from a high ground-state spin (S_T) combined with a large and negative axial magnetoanisotropy (D). The S_T of SMM results from local spin moments at TM ions (S_i) and exchange coupling between them (J_{ij}). Moreover, J_{ij} have to be important to well separate the ground spin state from the excited states; the relative high value of T_B is dependent on them. To tailor these quantities requires deeply understanding of magneto-structural correlations of SMMs. Previous theoretical studies of SMMs

success in calculating these quantities of synthesized SMMs, however, discussion about magneto-structural correlations of SMMs as well as suggestion for designing new SMMs are still missing. In this study, we focus on exploring magneto-structural correlations of a fascinating SMM system, i.e. distorted cubane $Mn^{4+}Mn^{3+}_3$ SMMs based on Density-functional theory (DFT), to support for tailoring J_{ij} of SMMs, as well as for designing high T_B SMMs.

Firstly, our calculated results demonstrate that intramolecular exchange coupling of known $Mn^{4+}Mn^{3+}_3$ SMMs is dominated by antiferromagnetic (AFM) couplings between the Mn^{4+} ions and the three Mn^{3+} ions resulting in a ferrimagnetic structure and $S_T = 9/2$ consistent with the experimental observation. The mechanism of AFM Mn^{4+}-Mn^{3+} coupling (J_{AB}) is determined by delocalization of 3d electrons from the d_{z^2} orbitals at the Mn^{3+} sites to the t_{2g} orbitals at the Mn^{4+} site through ligand orbitals which results in the π-like hybridization states among these orbitals just below the Fermi level. These results allows us to predict that J_{AB} will be strongest when the Mn^{3+}-L-Mn^{4+} exchange coupling angle $\alpha \approx 90^o$, while synthesized Mn_4 SMMs have $\alpha \approx 95^o$.

Secondly, by rational variations in ligands, novel $Mn^{4+}Mn^{3+}_3$ SMMs, having S_T of 9/2, α in a range of 88.5^o–95.5^o, and J_{AB}/k_B in a range of –36.77 K to –214.79 K, have been designed. The results confirm the correlation between J_{AB} and α. Moreover, this work reveals first possibilities of adopting N based ligands, NR' (R' = a radical), to form excellent exchange pathways between Mn ions in Mn_4 SMMs. Adopting N based ligands to form exchange pathways between Mn ions can enhance three times of J_{AB} in comparison to using O. Variation in the R' radical is demonstrated as an effective way to tailor and optimize the exchange pathways between Mn ions.

In conclusion, we have succeeded in exploring magneto-structural correlation in Mn_4 SMMs based on DFT. The results strongly support for synthesizing new superior Mn_4 SMMs with strong intramolecular exchange coupling.

Người trình bày: **Nguyễn Anh Tuấn**

90. First Principle Study on AlN Nano Wire

Vũ Ngọc Tước, Nguyễn Viêt Minh

We present a first-principle study on the atomic and electronic structure of AlN Nanowire and examine the depedence of surface stress on Nanowire lateral size and shape. The hexagonal wire size ranging as 10-16-22 and triangular wire ranging from 10-13-16-20. We investigate the unsaturated dangling bond state in the region of bandgap with varying the wire's diameter. We also calculated the surface formation energy and find that it decrease with increasing the wire diameter and a greater stability (lower surface formation energy) comes with hexagonal wires. We also study the dependence of theoretical prediction on various DFT functional treatment using Dmol3 local orbital density functional method with an effective core potential.

Người trình bày: **Vũ Ngọc Tước**

91. Computer Simulation of Microstructure in Disordered Systems

Lê Thế Vinh, Nguyễn Minh Quân, Dương Công Hiệp, Nguyễn Thành Tín, Nguyễn Tất Đạt, Đổng Quốc Việt

Computer simulation will be done to determine the local structure of disordered system. Twenty-four systems of SiO2, (Al2O3)x(SiO2)1-x, Co-B and Co-P at different densities is prepared by compressing the low-density. The microstructure will be analyzed through the pair radial distribution function, bond-angle distribution

and the characteristics of voids and void aggregations. We focused on two kinds of void aggregations: void clusters and void tubes.

Người trình bày: **Lê Thế Vinh**

92. Investigation of Thermodynamic Properties of Liquid Transition Metals

Lê Hoàng Anh, Đỗ Phương Liên

We present a study of thermodynamic properties of liquid transition metals. The cohesive energies and the heats of fusion have been calculated in the bond-order approach coupled with the cluster Bethe lattice method for 3d, 4d and 5d liquid transition metals, taking in account s-d hybridization which is treated self-consistently. The results obtained are in good agreement with experimental data. An analyze of the contributions related to the s- and d-electrons to the cohesive energies are realized and showed that s-electrons play an important part in the cohesion of liquid transition metals. The tendencies of thermodynamic properties for three series have been also discussed. So far, our work is the first systematic study of properties of cohesion of all the transition metals in their liquid phases.

Người trình bày: **Lê Hoàng Anh**

93. Investigation of Structural and Electronic Propertiesof Liquid Transition Metals and Their Alloys

Lê Hoàng Anh, Đỗ Phương Liên

We present a study of structural and electronic properties of 3d, 4d and 5d liquid transition metals and their alloys by calculating the interatomic potentials in the tight-binding bond-order approach coupled with the cluster Bethe lattice method and realizing dynamic molecular simulations The results method are in good agreement with accurate diffraction data. The tendencies of properties for three series have been also discussed. So far, our work is the first systematic study of structural and electronic properties of all the transition metals in their liquid phases.

Người trình bày: **Lê Hoàng Anh**

94. The Operator Method for non-Perturbation Calculations of Hydrogen Spectra in a Magnetic Field of Arbitrary Strength

Nguyễn Phương Duy Anh, Nguyễn Văn Hòa, Lê Văn Hoàng

By using the Laplace transformation we apply the operator method (OM) directly to the problem of a hydrogen atom in a magnetic field of arbitrary strength. The high-order corrections are calculated by both the perturbation theory and the iterative procedure and then compare each to other. The correction series are rapidly convergent that allow us to obtain exact numerical solutions for the considered problem.

Người trình bày: **Nguyễn Phương Duy Anh**

95. Density-Functional Study of Jahn-Teller Effect in BaTiO3

Nguyễn Tiến Cường, Nguyễn Anh Tuấn, Đỗ Văn Thanh, Nguyễn Hoàng Linh, Nguyễn Thùy Trang, Phạm Hương Thảo, Bạch Thành Công

The electronic structure and bonding modes of the perovskite oxide BaTiO3 in cubic and distorted tetragonal structures are investigated base on Density Functional Theory (DFT). The Density of State (DOS) and Muliken population analyses are brought out in order to examine Jahn-Teller effect. The results show that Ti displacement makes the charge transfer from O atoms to Ba and T atoms. Our results also indicate that Ba atoms play a relatively important role in distributing the charge transfer.

Người trình bày: **Nguyễn Tiến Cường**

96. ComputerSimulation On Local Structure And Diffusion In System Li2O-SiO2

Phạm Hữu Kiên, Vũ Văn Hùng, Phạm Khắc Hùng, Vương Thị Thúy

The local structure of liquid (SiO2)x(Li2O)1-x (x = 0.1, 0.2, 0.3, 0.4, 0.5) has been investigated using molecular dynamic models consisting of 3000 atoms at 2200 K. The local structure is analyzed through partial distribution function (PDF), coordination number and bond angle statistic. The obtained PDFs are in good agreement with experiment data. The simulation reveals that most Si atoms are four-fold coordinated, whereas the coordination of Li atoms are four-, five-, six-fold. We observe a clear corelation between the lithium

concentration and mobility of silicon and oxygen. This data results in the modifying the teterahedral network structure by lithium impurity.

Người trình bày: **Phạm Hữu Kiên**

97. Computer Simulation Of Interstitial Diffusion In Disordered Systems

Trịnh Văn Mùng, Hoàng Quốc Hoàn, Phạm Khắc Hùng

The direct calculation of diffusion in atomistic models with know interaction potential between impurity and matrix atoms is a long standing problem in glass science. A new calculation method overcoming the restriction of non-force method is applied to simulate diffusion in Lennard–Jones models and also in the regular disordered lattice. The size effect and the Arrhenius behavior for both amorphous and crystalline models are examined and discussed here. The simulation reveals some specific properties for interstitial diffusion in amorphous solids compared to crystal. In particular, we observe the close value of activation energy for amorphous and fcc models, meanwhile the pre-exponential coefficient of amorphous solid is similar to one of bcc crystal.

Người trình bày: **Trịnh Văn Mùng**

98. High Harmonic Generation Spectra of Basic Bases of DNA Interacting with Ultra-Short Laser Pulses

Phan Thị Cẩm Nhung, Nguyễn Ngọc Ty, Lê Văn Hoàng

By using the strong field approximation via Lewenstein model we calculate high-order harmonic generation (HHG) spectra induced while ultra-short pulses of intense lasers interacting with the basic bases of DNA such as Adenine (C5H5N5), Guanine (C5H5N5O), Cytosine (C4H5N3O), Uracil (C4H4N2O2), Thymine (C5H6N2O2). Analyzing the calculated data we can distinguish the bases from each other by the alignment dependence of HHG. Further more, we apply the iterative method, suggested in our previous work, for retrieving some structural information of the Cytosine base from the 'simulated experimental' HHG data.

Người trình bày: **Phan Thị Cẩm Nhung**

99. Genetic Algorithm and Retrieval of Interatomic Separations of the Complex Molecules by Ultrashort Laser Pulses

Nguyễn Ngọc Ty, Lê Văn Hoàng

We show that the iterative method suggested in our previous work is applicable for complex molecules (O3, OSC, and BrCN) in order to retrieve interatomic separations from high-order harmonic generation (HHG) spectra emitted by the molecules interacting with the ultrashort intense laser pulses. For retrieval of structure information, two parameters of interatomic separations in these cases, we need HHG spectra at least for two different alignments. For fitting procedure, the

genetic algorithm can be applied that reduces time-consuming in compare with the direct scanning method. This is very important for further application of molecules having a large number of structural parameters.

Người trình bày: **Nguyễn Ngọc Ty**

100. Tracking Acetylene/Vinylidene Isomerization Process by Ultrashort Laser Pulses using High Harmonic Generation

Nguyễn Ngọc Ty, Tăng Thị Bích Vân, Lê Văn Hoàng

We simulate the Acetylene/Vinylidene isomerization by the Born-Oppenheimer molecular dynamics method implemented in the GAUSSIAN 3.0 package. Furthermore, by using the Lewenstein model we then calculate the high-order harmonic generation (HHG) spectra emitted by C2H2 molecule during the chemical reaction path of isomerization due to interacting with the 10 fs pulse of the 800nm intense laser. We identify the intensity peaks of HHG spectra nearby the stable, meta-stable and transition states of the C2H2 molecule that can be useful for tracking the Acetylene/Vinylidene isomerization process.

Người trình bày: **Nguyễn Ngọc Ty**

HỘI NGHỊ VẬT LÝ LÝ THUYẾT TOÀN QUỐC LẦN THỨ 34
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