

Chinese Physics B

Volume 31 Number 3 March 2022

Contents

TOPICAL REVIEW — Optical field manipulation

- 033101** Review on typical applications and computational optimizations based on semiclassical methods in strong-field physics

Xun-Qin Huo, Wei-Feng Yang, Wen-Hui Dong, Fa-Cheng Jin, Xi-Wang Liu, Hong-Dan Zhang and Xiao-Hong Song

- 033201** Strong-field response time and its implications on attosecond measurement

Chao Chen, Jiayin Che, Xuejiao Xie, Shang Wang, Guoguo Xin and Yanjun Chen

TOPICAL REVIEW — Emerging photovoltaic materials and devices

- 037303** Surface modulation of halide perovskite films for efficient and stable solar cells

Qinxuan Dai, Chao Luo, Xianjin Wang, Feng Gao, Xiaole Jiang and Qing Zhao

- 038402** Applications and functions of rare-earth ions in perovskite solar cells

Limin Cang, Zongyao Qian, Jinpei Wang, Libao Chen, Zhigang Wan, Ke Yang, Hui Zhang and Yonghua Chen

SPECIAL TOPIC — Emerging photovoltaic materials and devices

- 037104** High-throughput computational material screening of the cycloalkane-based two-dimensional Dion–Jacobson halide perovskites for optoelectronics

Guoqi Zhao, Jiahao Xie, Kun Zhou, Bangyu Xing, Xinjiang Wang, Fuyu Tian, Xin He and Lijun Zhang

- 038803** An n–n type heterojunction enabling highly efficient carrier separation in inorganic solar cells

Gang Li, Yuqian Huang, Rongfeng Tang, Bo Che, Peng Xiao, Weitao Lian, Changfei Zhu and Tao Chen

- 038804** Reveal the large open-circuit voltage deficit of all-inorganic CsPbIBr₂ perovskite solar cells

Ying Hu, Jiaping Wang, Peng Zhao, Zhenhua Lin, Siyu Zhang, Jie Su, Miao Zhang, Jincheng Zhang, Jingjing Chang and Yue Hao

REVIEW

- 037501** A review on 3d transition metal dilute magnetic *REIn*₃ intermetallic compounds

Xin-Peng Guo, Yong-Quan Guo, Lin-Han Yin and Qiang He

(Continued on the Bookbinding Inside Back Cover)

038203 Lithium ion batteries cathode material: V_2O_5

Baohe Yuan, Xiang Yuan, Binger Zhang, Zheng An, Shijun Luo and Lulu Chen

038501 Graphene-based heterojunction for enhanced photodetectors

Haiting Yao, Xin Guo, Aida Bao, Haiyang Mao, Youchun Ma and Xuechao Li

DATA PAPER

038204 Measurements of the ^{107}Ag neutron capture cross sections with pulse height weighting technique at the CSNS Back-n facility

Xin-Xiang Li, Long-Xiang Liu, Wei Jiang, Jie Ren, Hong-Wei Wang, Gong-Tao Fan, Jian-Jun He, Xi-Guang Cao, Long-Long Song, Yue Zhang, Xin-Rong Hu, Zi-Rui Hao, Pan Kuang, Bing Jiang, Xiao-He Wang, Ji-Feng Hu, Jin-Cheng Wang, De-Xin Wang, Su-Yalatu Zhang, Ying-Du Liu, Xu Ma, Chun-Wang Ma, Yu-Ting Wang, Zhen-Dong An, Jun Su, Li-Yong Zhang, Yu-Xuan Yang, Wen-Bo Liu, Wan-Qing Su, Sheng Jin and Kai-Jie Chen

RAPID COMMUNICATION

030307 Measuring Loschmidt echo via Floquet engineering in superconducting circuits

Shou-Kuan Zhao, Zi-Yong Ge, Zhong-Cheng Xiang, Guang-Ming Xue, Hai-Sheng Yan, Zi-Ting Wang, Zhan Wang, Hui-Kai Xu, Fei-Fan Su, Zhao-Hua Yang, He Zhang, Yu-Ran Zhang, Xue-Yi Guo, Kai Xu, Ye Tian, Hai-Feng Yu, Dong-Ning Zheng, Heng Fan and Shi-Ping Zhao

037101 Electronic structure and spin-orbit coupling in ternary transition metal chalcogenides Cu_2TlX_2 ($X = \text{Se}, \text{Te}$)

Na Qin, Xian Du, Yangyang Lv, Lu Kang, Zhongxu Yin, Jingsong Zhou, Xu Gu, Qinqin Zhang, Runzhe Xu, Wenxuan Zhao, Yidian Li, Shuhua Yao, Yanfeng Chen, Zhongkai Liu, Lexian Yang and Yulin Chen

037405 Wire network behavior of superconducting films with lower symmetrical mesoscopic hole arrays

Wei-Gui Guo, Zi-Xi Pei and Xiang-Gang Qiu

038103 Characterization of the N-polar GaN film grown on C-plane sapphire and misoriented C-plane sapphire substrates by MOCVD

Xiaotao Hu, Yimeng Song, Zhaole Su, Haiqiang Jia, Wenxin Wang, Yang Jiang, Yangfeng Li and Hong Chen

GENERAL

030201 Residual symmetries, consistent-Riccati-expansion integrability, and interaction solutions of a new (3+1)-dimensional generalized Kadomtsev-Petviashvili equation

Jian-Wen Wu, Yue-Jin Cai and Ji Lin

- 030202 Dynamics and near-optimal control in a stochastic rumor propagation model incorporating media coverage and Lévy noise**
Liang'an Huo and Yafang Dong
- 030301 Geometric quantities of lower doubly excited bound states of helium**
Chengdong Zhou, Yuewu Yu, Sanjiang Yang and Haoxue Qiao
- 030302 Probabilistic resumable quantum teleportation in high dimensions**
Xiang Chen, Jin-Hua Zhang and Fu-Lin Zhang
- 030303 Tetrapartite entanglement measures of generalized GHZ state in the noninertial frames**
Qian Dong, R. Santana Carrillo, Guo-Hua Sun and Shi-Hai Dong
- 030304 Quantum partial least squares regression algorithm for multiple correlation problem**
Yan-Yan Hou, Jian Li, Xiu-Bo Chen and Yuan Tian
- 030305 Optical scheme to demonstrate state-independent quantum contextuality**
Ya-Ping He, Deng-Ke Qu, Lei Xiao, Kun-Kun Wang and Xiang Zhan
- 030306 Alternative non-Gaussianity measures for quantum states based on quantum fidelity**
Cheng Xiang, Shan-Shan Li, Sha-Sha Wen and Shao-Hua Xiang
- 030308 Quantum properties near the instability boundary in optomechanical system**
Han-Hao Fang, Zhi-Jiao Deng, Zhigang Zhu and Yan-Li Zhou
- 030501 Multifractal analysis of the software evolution in software networks**
Meili Liu, Xiaogang Qi and Hao Pan
- 030502 Inferring interactions of time-delayed dynamic networks by random state variable resetting**
Changbao Deng, Weinuo Jiang and Shihong Wang
- 030503 A class of two-dimensional rational maps with self-excited and hidden attractors**
Li-Ping Zhang, Yang Liu, Zhou-Chao Wei, Hai-Bo Jiang and Qin-Sheng Bi
- 030601 Three-step self-calibrating generalized phase-shifting interferometry**
Yu Zhang
- 030701 Finite element simulation of Love wave sensor for the detection of volatile organic gases**
Yan Wang, Su-Peng Liang, Shu-Lin Shang, Yong-Bing Xiao and Yu-Xin Yuan
- ELECTROMAGNETISM, OPTICS, ACOUSTICS, HEAT TRANSFER, CLASSICAL MECHANICS, AND FLUID DYNAMICS**
- 034201 Multi-frequency focusing of microjets generated by polygonal prisms**
Yu-Jing Yang, De-Long Zhang and Ping-Rang Hua
- 034202 New multiplexed system for synchronous measurement of out-of-plane deformation and two orthogonal slopes**
Yonghong Wang, Xiao Zhang, Qihan Zhao, Yanfeng Yao, Peizheng Yan and Biao Wang

- 034203 High-performance and fabrication friendly polarization demultiplexer**
Huan Guan, Yang Liu and Zhiyong Li
- 034204 An ultra-wideband 2-bit coding metasurface using Pancharatnam–Berry phase for radar cross-section reduction**
Bao-Qin Lin, Wen-Zhun Huang, Lin-Tao Lv, Jian-Xin Guo, Yan-Wen Wang and Hong-Jun Ye
- 034205 Color-image encryption scheme based on channel fusion and spherical diffraction**
Jun Wang, Yuan-Xi Zhang, Fan Wang, Ren-Jie Ni and Yu-Heng Hu
- 034206 Increasing the efficiency of post-selection in direct measurement of the quantum wave function**
Yong-Li Wen, Shanchao Zhang, Hui Yan and Shi-Liang Zhu
- 034207 The 266-nm ultraviolet-beam generation of all-fiberized super-large-mode-area narrow-linewidth nanosecond amplifier with tunable pulse width and repetition rate**
Shun Li, Ping-Xue Li, Min Yang, Ke-Xin Yu, Yun-Chen Zhu, Xue-Yan Dong and Chuan-Fei Yao
- 034208 Improved thermal property of strained InGaAlAs/AlGaAs quantum wells for 808-nm vertical cavity surface emitting lasers**
Zhuang-Zhuang Zhao, Meng Xun, Guan-Zhong Pan, Yun Sun, Jing-Tao Zhou and De-Xin Wu
- 034209 Interrogation of optical Ramsey spectrum and stability study of an ^{87}Sr optical lattice clock**
Jing-Jing Xia, Xiao-Tong Lu and Hong Chang
- 034210 Improving the spectral purity of single photons by a single-interferometer-coupled microring**
Yang Wang, Pingyu Zhu, Shichuan Xue, Yingwen Liu, Junjie Wu, Xuejun Yang and Ping Xu
- 034211 Independently tunable dual resonant dip refractive index sensor based on metal–insulator–metal waveguide with Q-shaped resonant cavity**
Haowen Chen, Yunping Qi, Jinghui Ding, Yujiao Yuan, Zhenting Tian and Xiangxian Wang
- 034301 Synthetical optimization of the structure dimension for the thermoacoustic regenerator**
Huifang Kang, Lingxiao Zhang, Jun Shen, Xiachen Ding, Zhenxing Li and Jun Liu
- 034302 Nonlinear oscillation characteristics of magnetic microbubbles under acoustic and magnetic fields**
Lixia Zhao, Huimin Shi, Isaac Bello, Jing Hu, Chenghui Wang and Runyang Mo
- 034303 High-efficiency unidirectional wavefront manipulation for broadband airborne sound with a planar device**
Yang Tan, Bin Liang and Jianchun Cheng
- 034601 Mechanism analysis and improved model for stick-slip friction behavior considering stress distribution variation of interface**
Jingyu Han, Jiahao Ding, Hongyu Wu and Shaoze Yan

034701 Effect of viscosity on stability and accuracy of the two-component lattice Boltzmann method with a multiple-relaxation-time collision operator investigated by the acoustic attenuation model

Le Bai, Ming-Lei Shan, Yu Yang, Na-Na Su, Jia-Wen Qian and Qing-Bang Han

034702 Characterization of premixed swirling methane/air diffusion flame through filtered Rayleigh scattering

Meng Li, Bo Yan, Shuang Chen, Li Chen and Jin-He Mu

034703 Particle captured by a field-modulating vortex through dielectrophoresis force

Bing Yan, Bo Chen, Zerui Peng and Yong-Liang Xiong

PHYSICS OF GASES, PLASMAS, AND ELECTRIC DISCHARGES

035201 Kinetic Alfvén waves in a deuterium-tritium fusion plasma with slowing-down distributed α -particles

Fei-Fei Lu and San-Qiu Liu

035202 Propagation of terahertz waves in nonuniform plasma slab under “electromagnetic window”

Hao Li, Zheng-Ping Zhang and Xin Yang

035203 Effect of initial phase on the Rayleigh–Taylor instability of a finite-thickness fluid shell

Hong-Yu Guo, Tao Cheng, Jing Li and Ying-Jun Li

035204 Effect of the number of defect particles on the structure and dispersion relation of a two-dimensional dust lattice system

Rangyue Zhang, Guannan Shi, Hanyu Tang, Yang Liu, Yanhong Liu and Feng Huang

CONDENSED MATTER: STRUCTURAL, MECHANICAL, AND THERMAL PROPERTIES

036101 Emerging of Ag particles on ZnO nanowire arrays for blue-ray hologram storage

Ning Li, Xin Li, Ming-Yue Zhang, Jing-Ying Miao, Shen-Cheng Fu and Xin-Tong Zhang

036102 Transition state and formation process of Stone–Wales defects in graphene

Jian-Hui Bai, Yin Yao and Ying-Zhao Jiang

036103 Effect of heavy ion irradiation on the interface traps of AlGaN/GaN high electron mobility transistors

Zheng-Zhao Lin, Ling Lü, Xue-Feng Zheng, Yan-Rong Cao, Pei-Pei Hu, Xin Fang and Xiao-Hua Ma

036104 First-principles study of stability of point defects and their effects on electronic properties of GaAs/AlGaAs superlattice

Shan Feng, Ming Jiang, Qi-Hang Qiu, Xiang-Hua Peng, Hai-Yan Xiao, Zi-Jiang Liu, Xiao-Tao Zu and Liang Qiao

036301 Boron at tera-Pascal pressures

Peiju Hu, Junhao Peng, Xing Xie, Minru Wen, Xin Zhang, Fugen Wu and Huafeng Dong

- 036401 Solid–liquid transition induced by the anisotropic diffusion of colloidal particles**
Fu-Jun Lin, Jing-Jing Liao, Jian-Chun Wu and Bao-Quan Ai
- 036801 Effect of an electric field on dewetting transition of nitrogen-water system**
Qi Feng, Jiaxian Li, Xiaoyan Zhou and Hangjun Lu
- 036802 High-energy x-ray diffraction study on phase transition asymmetry of plastic crystal neopentylglycol**
Zhe Zhang, Yan-Na Chen, Ji Qi, Zhao Zhang, Koji Ohara, Osami Sakata, Zhi-Dong Zhang and Bing Li
- 036803 Mode characteristics of nested eccentric waveguides constructed by two cylindrical nanowires coated with graphene**
Ji Liu, Lixia Yu and Wenrui Xue
- CONDENSED MATTER: ELECTRONIC STRUCTURE, ELECTRICAL, MAGNETIC, AND OPTICAL PROPERTIES**
- 037102 Intrinsic V vacancy and large magnetoresistance in $V_{1-\delta}Sb_2$ single crystal**
Yong Zhang, Xinliang Huang, Jinglei Zhang, Wenshuai Gao, Xiangde Zhu and Li Pi
- 037103 Growth, characterization, and Raman spectra of the 1T phases of $TiTe_2$, $TiSe_2$, and TiS_2**
Xiao-Fang Tang, Shuang-Xing Zhu, Hao Liu, Chen Zhang, Qi-Yi Wu, Zi-Teng Liu, Jiao-Jiao Song, Xiao Guo, Yong-Song Wang, He Ma, Yin-Zou Zhao, Fan-Ying Wu, Shu-Yu Liu, Kai-Hui Liu, Ya-Hua Yuan, Han Huang, Jun He, Wen Xu, Hai-Yun Liu, Yu-Xia Duan and Jian-Qiao Meng
- 037301 Magnetic proximity effect induced spin splitting in two-dimensional antimonene/ Fe_3GeTe_2 van der Waals heterostructures**
Xiuya Su, Helin Qin, Zhongbo Yan, Dingyong Zhong and Donghui Guo
- 037302 Entanglement spectrum of non-Abelian anyons**
Ying-Hai Wu
- 037304 First principles study on geometric and electronic properties of two-dimensional Nb_2CT_x MXenes**
Guoliang Xu, Jing Wang, Xilin Zhang and Zongxian Yang
- 037305 Spin–orbit stable dirac nodal line in monolayer B_6O**
Wen-Rong Liu, Liang Zhang, Xiao-Jing Dong, Wei-Xiao Ji, Pei-Ji Wang and Chang-Wen Zhang
- 037401 Electronic properties and interfacial coupling in Pb islands on single-crystalline graphene**
Jing-Peng Song and Ang Li
- 037402 Induced current of high temperature superconducting loops by combination of exciting coil and thermal switch**
Jia-Wen Wang, Yin-Shun Wang, Hua Chai, Ling-Feng Zhu and Wei Pi
- 037403 On the origin of the anomalous sign reversal in the Hall effect in Nb thin films**
Dan Zhou, Han-Song Zeng, Rujun Tang, Zhihong Hang, Zhiwei Hu, Zixi Pei and Xinsheng Ling

- 037404 Dynamic vortex Mott transition in triangular superconducting arrays**
Zi-Xi Pei, Wei-Gui Guo and Xiang-Gang Qiu
- 037406 Superconductivity in $\text{CuIr}_{2-x}\text{Al}_x\text{Te}_4$ telluride chalcogenides**
Dong Yan, Lingyong Zeng, Yijie Zeng, Yishi Lin, Junjie Yin, Meng Wang, Yihua Wang, Daoxin Yao and Huixia Luo
- 037801 High-pressure Raman study of osmium and rhenium up to 200 GPa and pressure dependent elastic shear modulus C_{44}**
Jingyi Liu, Yu Tao, Chunmei Fan, Binbin Wu, Qiqi Tang and Li Lei
- 037802 Enhancing the photo-luminescence stability of $\text{CH}_3\text{NH}_3\text{PbI}_3$ film with ionic liquids**
Weifeng Ma, Chunjie Ding, Nasrullah Wazir, Xianshuang Wang, Denan Kong, An Li, Bingsuo Zou and Ruibin Liu
- 037803 Surface-enhanced fluorescence and application study based on Ag-wheat leaves**
Hongwen Cao, Liting Guo, Zhen Sun, Tifeng Jiao and Mingli Wang
- 037804 A flexible ultra-broadband metamaterial absorber working on whole K-bands with polarization-insensitive and wide-angle stability**
Tao Wang, He-He He, Meng-Di Ding, Jian-Bo Mao, Ren Sun and Lei Sheng
- INTERDISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY**
- 038101 A high-quality-factor ultra-narrowband perfect metamaterial absorber based on monolayer molybdenum disulfide**
Liyang Jiang, Yingting Yi, Yijun Tang, Zhiyou Li, Zao Yi, Li Liu, Xifang Chen, Ronghua Jian, Pinghui Wu and Peiguang Yan
- 038102 Differential nonlinear photocarrier radiometry for characterizing ultra-low energy boron implantation in silicon**
Xiao-Ke Lei, Bin-Cheng Li, Qi-Ming Sun, Jing Wang, Chun-Ming Gao and Ya-Fei Wang
- 038201 Influence of intramolecular hydrogen bond formation sites on fluorescence mechanism**
Hong-Bin Zhan, Heng-Wei Zhang, Jun-Jie Jiang, Yi Wang, Xu Fei, Jing Tian
- 038202 A DFT/TD-DFT study of effect of different substituent on ESIPT fluorescence features of 2-(2'-hydroxyphenyl)-4-chloro-methylthiazole derivatives**
Shen-Yang Su, Xiu-Ning Liang and Hua Fang
- 038401 A low-cost invasive microwave ablation antenna with a directional heating pattern**
Zhang Wen, Xian-Qi Lin, Chen-Nan Li and Yu-Lu Fan
- 038502 Magnetoresistance effect in vertical NiFe/graphene/NiFe junctions**
Pei-Sen Li, Jun-Ping Peng, Yue-Guo Hu, Yan-Rui Guo, Wei-Cheng Qiu, Rui-Nan Wu, Meng-Chun Pan, Jia-Fei Hu, Di-Xiang Chen and Qi Zhang

038503 Analysis of the generation mechanism of the S-shaped J – V curves of MoS₂/Si-based solar cells

He-Ju Xu, Li-Tao Xin, Dong-Qiang Chen, Ri-Dong Cong and Wei Yu

038504 Facile sensitizing of PbSe film for near-infrared photodetector by microwave plasma processing

Kangyi Zhao, Shuanglong Feng, Chan Yang, Jun Shen and Yongqi Fu

038701 Long range electromagnetic field nature of nerve signal propagation in myelinated axons

Qing-Wei Zhai, Kelvin J A Ooi, Sheng-Yong Xu and C K Ong

038801 Charge transfer modification of inverted planar perovskite solar cells by NiO_{*x*}/Sr:NiO_{*x*} bilayer hole transport layer

Qiaopeng Cui, Liang Zhao, Xuewen Sun, Qiannan Yao, Sheng Huang, Lei Zhu, Yulong Zhao, Jian Song and Yinghuai Qiang

038802 Effect of net carriers at the interconnection layer in tandem organic solar cells

Li-Jia Chen, Guo-Xi Niu, Lian-Bin Niu and Qun-Liang Song