

# 物 理 学 报

第 71 卷 第 19 期 2022 年 10 月 5 日

## 目 次

### 总论

- 190201 有限线法及其在流固域间耦合传热中的应用 ..... 高效伟 丁金兴 刘华零  
190301 不同光学网络结构玻色采样发生随机光子损失的模拟研究 ... 季阳 陈美玲 黄汛 吴永政 兰冰  
190501 高斯色噪声激励下非对称双稳耦合网络系统的随机共振 ..... 王烨花 何美娟  
190502 基于三个耦合量子点的四端混合驱动制冷机 ..... 刘行 徐帅 高金柱 何济洲

### 核物理学

- 192101 天体环境下  $^{66}\text{Fe}$  的电子俘获几率计算 ..... 秦文韬 支启军 杨友昌  
192501 14 MeV 附近  $^{191}\text{Ir}(n,2n)^{190}\text{Ir}$  反应截面实验研究 ... 朱传新 秦建国 郑普 蒋励 朱通华 鹿心鑫  
192801 Ti 含量对  $\text{TiB}_2\text{-SiC-Ti}$  材料制备和性能的影响 .....  
..... 何晓珣 李炳生 刘瑞 张桐民 曹兴忠 陈黎明 徐帅

### 原子和分子物理学

- 193101  $\text{N}_2^+$  分子离子  $X^2\Sigma_g^+$ ,  $A^2\Pi_u$  和  $B^2\Sigma_u^+$  态的不透明度 ..... 陈晨 赵国鹏 祁月盈 吴勇 王建国  
193201 反旋双色椭圆偏场中 Ar 非次序双电离电子关联的强度依赖 ... 苏杰 刘子超 廖健颖 李盈宾 黄诚  
193301 基于二极管激光消光光谱的高温气体与颗粒物同时探测研究 .....  
..... 张铭珂 高振威 高光珍 江宇豪 蔡廷栋  
193302 倒 Y 型四能级系统中吸收谱线的窄化极限研究 ..... 邱凤清 贾宁 钱静

### 电磁学、光学、声学、传热学、经典力学和流体动力学

- 194101 拓扑自旋光子晶体中螺旋边界态单向传输调控研究 .....  
..... 隋文杰 张玉 张紫瑞 王小龙 张洪方 史强 杨冰  
194102 面向激光驱动质子束应用的弱聚焦磁场束线设计研究 .....  
..... 朱军高 卢海洋 赵媛 赖美福 古永力 徐世祥 周沧涛  
194201 剪切光束成像技术稀疏重构算法 ..... 陈明徕 刘辉 张羽 罗秀娟 马彩文 岳泽霖 赵晶  
194202 相位可压缩相干态的高阶光子反聚束效应 .....  
..... 张浩杰 郭龔强 郭晓敏 张健飞 左冠华 张玉驰 张天才  
194203 一维超导传输线腔晶格中的拓扑相变和拓扑量子态的调制 ..... 王伟 王一平  
194204 增益开关线偏振单频脉冲光纤激光器 ... 张万儒 陈思雨 粟荣涛 姜曼 李灿 马阎星 周朴  
194205 短内腔激光器对光子储备池计算的优化 ..... 赵彤 谢文丽 许俊伟 贾志伟  
194206 局部异常因子优化的椭圆拟合算法及其在光纤振动传感相位解调中的应用 .....  
..... 张令春 姜海明 张俊喜 谢康  
194301 三维空腔流动波系建模及模态演化 ..... 罗勇 杨党国 武从海 李虎 张树海 吴军强  
194601 二维  $\text{MoS}_2$  压痕过程异质界面范德瓦耳斯力引起的撕裂行为 ..... 李耀华 董耀勇 董辉 郑学军  
194701 横向矩形微槽抑制高超声速第二模态扰动波的参数化研究 .....  
..... 刘勇 涂国华 向星皓 李晓虎 郭启龙 万兵兵  
194702 二维湍流热对流最大速度  $Re$  数特性及流态突变特征  $Re$  数 ..... 何建超 方明卫 包芸  
194703 三角形结构中磁涡旋自旋波模式的研究 .....  
..... 强进 何开宙 刘东妮 卢启海 韩根亮 宋玉哲 王向谦

## 气体、等离子体和放电物理

- 195201 电四极跃迁对电子束离子阱等离子体中离子能级布居的影响 ..... 孟举 何贞岑 颜君 吴泽清 姚科 李冀光 吴勇 王建国  
195202 星光 III 装置上材料动态压缩过程的激光质子照相实验研究 ..... 黄华 李江涛 王倩男  
孟令彪 齐伟 洪伟 张智猛 张博 贺书凯 崔波 伍艺通 张航 吉亮亮 周维民 胡建波  
195203 多模式离子推力器放电室和栅极设计及其性能实验研究 ..... 李建鹏 赵以德 靳伍银 张兴民 李娟 王彦龙

## 凝聚物质: 结构、力学和热学性质

- 196101 不同方向石墨烯片构筑纳米孔隙浸润特征 ..... 王文远 谢章 郝少倩 吴锋民 寇建龙  
196201 超紧凑硅基混合表面等离激元光场窄化器件的实验研究 ..... 孙鹏斐 朱科建 许鹏飞 刘兴鹏 孙堂友 李海鸥 周治平  
196801 多层石墨烯与 TiAl 合金复合材料固相烧结过程中  $Ti_2AlC$  与  $Ti_3AlC$  的形成机制 ..... 吴明宇 弭光宝 李培杰 黄旭

## 凝聚物质: 电子结构、电学、磁学和光学性质

- 197301 层状  $Bi_{1-x}Sb_xSe$  纳米薄膜的制备及其热电性能研究 ..... 许静 何梓民 杨文龙 吴荣 赖晓芳 简基康  
197501 外尔半金属  $WTe_2/Ti$  异质结的热稳定性拉曼散射研究 ..... 刘娜 王译 李文波 张丽艳 何世坤 赵建坤 赵纪军  
197502 金属磁记忆应变诱导磁性变化的原子尺度作用机理 ..... 王思远 梁添寿 时朋朋  
197701  $In_2Se_3$  薄膜的掺杂效应及其纳米带铁电性 ..... 黄鸿飞 姚杨 姚承君 郝翔 吴银忠  
197901 氧氯化铋/铋铅氯范德瓦耳斯异质结环境稳定性与光电性质的第一性原理研究 ..... 姚熠舟 曹丹 颜洁 刘雪吟 王建峰 姜舟婷 舒海波

## 物理学交叉学科及有关科学技术领域

- 198101 纳米金刚石/竖立石墨烯复合三维电极的制备及电化学性能研究 ..... 蒋梅燕 王平 陈爱盛 陈成克 李晓 鲁少华 胡晓君  
198102 氮化镓相图预测及其高压熔化特性研究 ..... 雷振帅 孙小伟 刘子江 宋婷 田俊红  
198501 一种能够改善鲁棒性的新型 4H-SiC ESD 防护器件 ..... 常帅军 马海伦 李浩 欧树基 郭建飞 钟鸣浩 刘莉  
198502 自旋偏压驱动的硅烯和锗烯光控晶体管 ..... 郑军 马力 李春雷 袁瑞昶 郭亚涛 付旭日

## 地球物理学、天文学和天体物理学

- 199601 纳米晶  $CoNiCrFeMn$  高熵合金力学性能的原子尺度分析 ..... 陈晶晶 邱小林 李柯 周丹 袁军军

文章图片的彩色效果详见网刊



扫码阅读  
电子版

# ACTA PHYSICA SINICA

Vol. 71, No. 19, October 5, 2022

## CONTENTS

### GENERAL

- 190201 Finite line method and its application in coupled heat transfer between fluid-solid domains  
*Gao Xiao-Wei Ding Jin-Xing Liu Hua-Yu*
- 190301 Simulation of random photon loss in boson sampling of different optical networks  
*Ji Yang Chen Mei-Ling Huang Xun Wu Yong-Zheng Lan Bing*
- 190501 Stochastic resonance in asymmetric bistable coupled network systems driven by Gaussian colored noise  
*Wang Ye-Hua He Mei-Juan*
- 190502 Four-terminal hybrid driven refrigerator based on three coupled quantum dots  
*Liu Xing Xu Shuai Gao Jin-Zhu He Ji-Zhou*

### NUCLEAR PHYSICS

- 192101 Calculations of electron capture rates of  $^{66}\text{Fe}$  in astrophysical environment  
*Qing Wen-Tao Zhi Qi-Jun Yang You-Chang*
- 192501 Measurement of  $^{191}\text{Ir}(n,2n)^{190}\text{Ir}$  cross section near 14 MeV  
*Zhu Chuan-Xin Qin Jian-Guo Zheng Pu Jiang Li Zhu Tong-Hua Lu Xin-Xin*
- 192801 Effect of Ti content on preparation and properties of  $\text{TiB}_2\text{-SiC-Ti}$  materials  
*He Xiao-Xun Li Bing-Sheng Liu Rui Zhang Tong-Min Cao Xing-Zhong Chen Li-Ming Xu Shuai*

### ATOMIC AND MOLECULAR PHYSICS

- 193101 Molecular opacities of  $X^2\Sigma_g^+$ ,  $A^2\Pi_u$  and  $B^2\Sigma_u^+$  states of nitrogen cation  
*Chen Chen Zhao Guo-Peng Qi Yue-Ying Wu Yong Wang Jian-Guo*
- 193201 Intensity-dependent electron correlation in nonsequential double ionization of Ar atoms in counter-rotating two-color elliptically polarized laser fields  
*Su Jie Liu Zi-Chao Liao Jian-Ying Li Ying-Bin Huang Cheng*
- 193301 Simultaneous detection of particle and  $\text{C}_2\text{H}_2$  at high temperature using tunable diode laser extinction spectroscopy  
*Zhang Ming-Ke Gao Zhen-Wei Gao Guang-Zhen Jiang Yu-Hao Cai Ting-Dong*
- 193302 Narrowing the absorption linewidth and its limitation in a four-level inverted-Y atomic system  
*Di Feng-Qing Jia Ning Qian Jing*

### ELECTROMAGNETISM, OPTICS, ACOUSTICS, HEAT TRANSFER, CLASSICAL MECHANICS, AND FLUID DYNAMICS

- 194101 Unidirectional propagation control of helical edge states in topological spin photonic crystals  
*Sui Wen-Jie Zhang Yu Zhang Zi-Rui Wang Xiao-Long Zhang Hong-Fang Shi Qiang Yang Bing*
- 194102 Beamline design with weak-focusing magnetic field for applications of laser-driven proton beams  
*Zhu Jun-Gao Lu Hai-Yang Zhao Yuan Lai Mei-Fu Gu Yong-Li Xu Shi-Xiang Zhou Cang-Tao*
- 194201 Spatial domain sparse reconstruction algorithm of sheared beam imaging  
*Chen Ming-Lai Liu Hui Zhang Yu Luo Xiu-Juan Ma Cai-Wen Yue Ze-Lin Zhao Jing*

(Continued)

- 194202 Higher-order photon antibunching of phase-variable squeezed coherent state  
*Zhang Hao-Jie Guo Yan-Qiang Guo Xiao-Min Zhang Jian-Fei Zuo Guan-Hua  
 Zhang Yu-Chi Zhang Tian-Cai*
- 194203 Modulation of topological phase transitions and topological quantum states in one-dimensional superconducting transmission line cavities lattice  
*Wang Wei Wang Yi-Ping*
- 194204 Gain switched linearly polarized single-frequency pulsed fiber laser  
*Zhang Wan-Ru Chen Si-Yu Su Rong-Tao Jiang Man Li Can Ma Yan-Xing Zhou Pu*
- 194205 Optimization of photonic reservoir computing using short internal cavity laser  
*Zhao Tong Xie Wen-Li Xu Jun-Wei Jia Zhi-Wei*
- 194206 Phase demodulation of fiber vibration sensing by modified ellipse fitting algorithm based on local outlier factor optimization  
*Zhang Ling-Chun Jiang Hai-Ming Zhang Jun-Xi Xie Kang*
- 194301 Waves model of three-dimensional cavity flow and its oscillation mode evolution  
*Luo Yong Yang Dang-Guo Wu Cong-Hai Li Hu Zhang Shu-Hai Wu Jun-Qiang*
- 194601 Tearing behavior induced by van der Waals force at heterogeneous interface during two-dimensional MoS<sub>2</sub> nanoindentation  
*Li Yao-Hua Dong Yao-Yong Dong Hui Zheng Xue-Jun*
- 194701 Parametrization of suppressing hypersonic second-mode waves by transverse rectangular microgrooves  
*Liu Yong Tu Guo-Hua Xiang Xing-Hao Li Xiao-Hu Guo Qi-Long Wan Bing-Bing*
- 194702 Scaling of Reynolds number based on maximum velocity and characteristic Reynolds number in two-dimensional thermal turbulence convection  
*He Jian-Chao Fang Ming-Wei Bao Yun*
- 194703 Study of magnetic vortex spin wave mode in triangular structures  
*Qiang Jin He Kai-Zhou Liu Dong-Ni Lu Qi-Hai Han Gen-Liang Song Yu-Zhe  
 Wang Xiang-Qian*

## PHYSICS OF GASES, PLASMAS, AND ELECTRIC DISCHARGES

- 195201 Effects of electric quadrupole transitions on ion energy-level populations of in electron beam ion trap plasma  
*Meng Ju He Zhen-Cen Yan Jun Wu Ze-Qing Yao Ke Li Ji-Guang Wu Yong  
 Wang Jian-Guo*
- 195202 Experimental study on the dynamic compression of materials at XGIII facility by laser proton photography  
*Huang Hua Li Jiang-Tao Wang Qian-Nan Meng Ling-Biao Qi Wei Hong Wei  
 Zhang Zhi-Meng Zhang Bo He Shu-Kai Cui Bo Wu Yi-Tong Zhang Hang  
 Ji Liang-Liang Zhou Wei-Min Hu Jian-Bo*
- 195203 Design and performance test of discharge chamber and grid for multi-mode ion thrusters  
*Li Jian-Peng Zhao Yi-De Jin Wu-Yin Zhang Xing-Min Li Juan Wang Yan-Long*

## CONDENSED MATTER: STRUCTURAL, MECHANICAL, AND THERMAL PROPERTIES

- 196101 Infiltration characteristics of nanochannels composed of graphene sheets in different directions  
*Wang Wen-Yuan Xie Zhang Hao Shao-Qian Wu Feng-Min Kou Jian-Long*
- 196201 Experimental research on ultracompact silicon hybrid plasmonic nanofocusing device  
*Sun Peng-Fei Zhu Ke-Jian Xu Peng-Fei Liu Xing-Peng Sun Tang-You Li Hai-Ou  
 Zhou Zhi-Ping*
- 196801 Formation mechanisms of Ti<sub>2</sub>AlC and Ti<sub>3</sub>AlC during solid-state sintering between multilayer graphene and TiAl alloy composite  
*Wu Ming-Yu Mi Guang-Bao Li Pei-Jie Huang Xu*

(Continued)

## CONDENSED MATTER: ELECTRONIC STRUCTURE, ELECTRICAL, MAGNETIC, AND OPTICAL PROPERTIES

- 197301 Preparation and thermoelectric properties of layered  $\text{Bi}_{1-x}\text{Sb}_x\text{Se}$  nanocrystalline films  
*Xu Jing He Zi-Min Yang Wen-Long Wu Rong Lai Xiao-Fang Jian Ji-Kang*
- 197501 Thermal stability study of Weyl semimetal  $\text{WTe}_2/\text{Ti}$  heterostructures by Raman scattering  
*Liu Na Wang Yi Li Wen-Bo Zhang Li-Yan He Shi-Kun Zhao Jian-Kun Zhao Ji-Jun*
- 197502 Mechanism of strain-induced magnetic properties changes for metal magnetic memory technology on atomic scale  
*Wang Si-Yuan Liang Tian-Shou Shi Peng-Peng*
- 197701 Doping effect and ferroelectricity of nanoribbons of  $\text{In}_2\text{Se}_3$  monolayer  
*Huang Hong-Fei Yao Yang Yao Cheng-Jun Hao Xiang Wu Yin-Zhong*
- 197901 A first-principles study on environmental stability and optoelectronic properties of bismuth oxychloride/ cesium lead chloride van der Waals heterojunctions  
*Yao Yi-Zhou Cao Dan Yan Jie Liu Xue-Yin Wang Jian-Feng Jiang Zhou-Ting Shu Hai-Bo*

## INTERDISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY

- 198101 Preparation and electrochemical properties of nano-diamond/vertical graphene composite three-dimensional electrodes  
*Jiang Mei-Yan Wang Ping Chen Ai-Sheng Chen Cheng-Ke Li Xiao Lu Shao-Hua Hu Xiao-Jun*
- 198102 Phase diagram prediction and high pressure melting characteristics of GaN  
*Lei Zhen-Shuai Sun Xiao-Wei Liu Zi-Jiang Song Ting Tian Jun-Hong*
- 198501 A novel 4H-SiC ESD protection device with improved robustness  
*Chang Shuai-Jun Ma Hai-Lun Li Hao Ou Shu-Ji Guo Jian-Fei Zhong Ming-Hao Liu Li*
- 198502 Optically controlled silicene and germanene transistors driven by spin-bias  
*Zheng Jun Ma Li Li Chun-Lei Yuan Rui-Yang Guo Ya-Tao Fu Xu-Ri*

## GEOPHYSICS, ASTRONOMY, AND ASTROPHYSICS

- 199601 Mechanical performance analysis of nanocrystalline CoNiCrFeMn high entropy alloy: atomic simulation method  
*Chen Jing-Jing Qiu Xiao-Lin Li Ke Zhou Dan Yuan Jun-Jun*

Color figures can be viewed in the online issue.



Online issue