

物 理 学 报

第 74 卷 第 5 期 2025 年 3 月 5 日

目 次

仪器与测量

- 059501 0.1 mHz—1 Hz 频段超低噪声光电探测器实验研究 **封面文章**
..... 尚鑫 李番 马正磊 黄天时 党昊 李卫 尹王保 田龙 陈力荣 郑耀辉
- 059502 eXTP 聚焦镜电子偏转器仿真分析与设计 ... 郑人洲 强鹏飞 杨彦信 闫永清 李悦 盛立志 陈勇

核物理学

- 052401 ^{208}Pb 的 Lane 自洽色散光学势 杜文青 赵岫鸟
- 052501 s 夸克物质的边界效应和 K 介子自相似结构对夸克胶子等离子体-强子相变的影响
..... 戴婷婷 程鸾 丁慧强 张卫宁 王恩科

原子和分子物理学

- 053101 Au/CeO₂(111) 表面吸附的电荷转移特性 田馨 舒鹏丽 张珂童 曾德超 姚志飞
赵波慧 任晓森 秦丽 朱强 魏久焱 温煊飞 李艳君 菅原康弘 唐军 马宗敏 刘俊

电磁学、光学、声学、传热学、经典力学和流体动力学

- 054201 双振荡场空间分离对真空中电子-正电子对产生的影响 赵文呈 江森 徐妙华 李英骏
- 054202 微波-声子与光-磁纠缠态的产生 徐明慧 刘晓敏 史佳佳 张冲 张静 杨荣国 郜江瑞
- 054203 基于主被动分解法的微纳激光混沌系统的复用同步实现 穆鹏华 王译乔 贺鹏飞 徐源
- 054204 分光镜厚度对双臂 Tolansky 干涉自准直仪测角准确性的影响
..... 方振远 张宝武 崔建军 张斌 陈恺 许子杰 朱玲 孙怡 罗贤欢
- 054301 基于定向声源的局域型声学斯格明子模式的选择性激发 ... 张孝悦 徐华锋 陈婉娜 周农 吴宏伟
- 054701 大密度比气泡在多孔介质通道内上升行为的三维介观数值模拟 赵兹卿 严裕 姜钦

气体、等离子体和放电物理

- 055201 微空心阴极自脉冲放电微观动力学过程 梁远毅 方振松 贺亚峰 李庆 何寿杰
- 055202 HL-2A 托卡马克电子回旋共振加热调制对湍流驱动和传播的影响
..... 胡莹欣 赵开君 李继全 严龙文 许健强 黄治辉 余德良 谢耀禹 丁肖冠 温思宇
- 055203 中国首台准环对称仿星器中线圈形变对磁拓扑结构的影响 李丹 刘海峰
- 055204 水电导率对水下微秒脉冲流光放电形态的影响 李霄 温小琼 杨元天

凝聚物质: 结构、力学和热学性质

- 056101 双沟槽 SiC MOSFET 总剂量效应
..... 朱文璐 郭红霞 李洋帆 马武英 张凤祁 白如雪 钟向丽 李济芳 曹彦辉 琚安安

056102 铈钕合金神经网络势函数构建及其低温时效性质的分子动力学 苏锐 李庆安 管鹏飞

凝聚物质: 电子结构、电学、磁学和光学性质

057101 卤素及含氧元素掺杂对 α -2-石墨炔纳米带的负微分电阻效应与自旋过滤效应的调控 李晓波 刘帅奇 黄演 马玉 丁文策

057301 温度循环对硅通孔绝缘层漏电机质的影响 任云坤 陈思 秦飞

057401 用于射频传输线制备的 YBCO 薄膜工艺开发与特性研究 田清文 原蒲升 余慧勤 汪书娜 刘晓宇 李凌云 尤立星

057402 竖直取向 MoS_2 纳米片复合 Ag 基底的表面增强拉曼光谱效应及机制 戴硕 李振 张超 郁菁 赵晓菲 吴阳 满宝元

057601 微波谐振腔中磁双层的零阻尼效应 尹凡 戴昌杰 张影 于海林 肖杨

057701 压电纤维复合材料智能传感器的有限元预测与器件性能 高裕昆 赵洁 周晶晶 周静

057801 一种基于多目标粒子群算法的太赫兹超材料吸收器快速优化方法 王玉蓉 屈薇薇 李桂林 邓琥 尚丽平

物理学交叉学科及有关科学技术领域

058101 共格析出强化的超高强度马氏体时效不锈钢组织和力学性能 杨宇贤 王镇华 王清 唐才宇 万鹏 曹达华 董闯

058201 等离子体处理构建梯度分布氧空位提升三氧化钨电致变色性能 江以航 曹俸华 栗浩森 聂永杰 李国倡 魏艳慧 鲁广昊 李盛涛 朱远惟

058401 光控多门极晶闸管的多种工作模式 王凌云 刘宏伟 袁建强 谢卫平 栾崇彪 李洪涛 张建德 谌怡 何泱 刘小俐 高彬

058501 碳纳米管场效应晶体管的 X 射线辐照效应 曾天祥 李济芳 郭红霞 马武英 雷志锋 钟向丽 张鸿 王颂文

地球物理学、天文学和天体物理学

059201 基于塑料闪烁体探测器的宇宙线缪子与太阳调制效应观测 王德鑫 张蕊 尉德康 那蕙 姚张浩 吴凌赫 张苏雅拉吐 梁泰然 黄美容 王志龙 白宇 黄永顺 杨雪 张嘉文 刘梦迪 马菁 于静 纪秀艳 于伊丽琦 邵学鹏

059202 柱矢量涡旋光束在自由空间中传输时角动量的全矢量特性 高雨洁 李晋红 王静 刘晋宏 尹晓金

(本期责任编辑: 吕国华)

文章图片的彩色效果详见网刊



扫码阅读
电子版

ACTA PHYSICA SINICA

Vol. 74, No. 5, March 5, 2025

CONTENTS

INSTRUMENTATION AND MEASUREMENT

- 059501 Experimental study of ultra-low noise photodetectors in 0.1 mHz–1 Hz frequency band
COVER ARTICLE
*SHANG Xin LI Fan MA Zhenglei HUANG Tianshi DANG Hao LI Wei
YIN Wangbao TIAN Long CHEN Lirong ZHENG Yaohui*
- 059502 Simulation analysis and design of electron deflector for eXTP focusing telescope
*ZHENG Renzhou QIANG Pengfei YANG Yanji YAN Yongqing LI Yue SHENG Lizhi
CHEN Yong*

NUCLEAR PHYSICS

- 052401 Research on Lane-consistent dispersive optical-model potential for ^{208}Pb
DU Wenqing ZHAO Xiuniao
- 052501 The boundary effect of s quark matter and self-similarity structure influence of K meson on quark-gluon plasma-hadron phase transition
DAI Tingting CHENG Luan DING Huiqiang ZHANG Weining WANG Enke

ATOMIC AND MOLECULAR PHYSICS

- 053101 Charge transfer characteristics of Au adsorption on $\text{CeO}_2(111)$ surface
*TIAN Xin SHU Pengli ZHANG Ketong ZENG Dechao YAO Zhifei ZHAO Bohui
REN Xiaosen QIN Li ZHU Qiang WEI Jiuyan WEN Huanfei LI Yanjun
Yasuhiro Sugawara TANG Jun MA Zongmin LIU Jun*

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

- 054201 Research on electron-positron pair production in vacuum induced by spatially separated dual oscillating fields
ZHAO Wencheng JIANG Miao XU Miaohua LI Yingjun
- 054202 Generation of microwave-phonon and magnon-optics entangled states
*XU Minghui LIU Xiaomin SHI Jiajia ZHANG Chong ZHANG Jing YANG Rongguo
GAO Jiangrui*
- 054203 Multiplexing synchronization implementation of micro-nano laser chaotic system based on active-passive decomposition method
MU Penghua WANG Yiqiao HE Pengfei XU Yuan
- 054204 Effect of beam splitter thickness on angle measurement accuracy of dual-arm Tolansky interferometric autocollimator
*FANG Zhenyuan ZHANG Baowu CUI Jianjun ZHANG Bin CHEN Kai XU Zijie
ZHU Ling SUN Yi LUO Xianhuan*
- 054301 Selective excitation of localized acoustic skyrmion modes based on directional sound sources
ZHANG Xiaoyue XU Huafeng CHEN Wanna ZHOU Nong WU Hongwei

(Continued)

- 054701 Three-dimensional mesoscopic numerical simulation of the rising behavior of bubbles with large density ratio in porous media channels
ZHAO Ziqing YAN Yu LOU Qin

PHYSICS OF GASES, PLASMAS, AND ELECTRIC DISCHARGES

- 055201 Experiment and simulation on spatiotemporal microscopic dynamics of self-pulsing discharge in micro-hollow cathode
LIANG Yuanyi FANG Zhensong HE Yafeng LI Qing HE Shoujie
- 055202 Effects of electron cyclotron resonance heating modulation on edge turbulence driving and spreading in HL-2A tokamak
HU Yingxin ZHAO Kaijun LI Jiquan YAN Longwen XU Jianqiang HUANG Zhihui YU Deliang XIE Yaoyu DING Xiaoguan WEN Siyu
- 055203 Influence of coil deformation on magnetic topology structure in Chinese first quasi-toroidally symmetric stellarator
LI Dan LIU Haifeng
- 055204 Effect of water conductivity on underwater microsecond pulsed streamer discharge type
LI Xiao WEN Xiaoqiong YANG Yuantian

CONDENSED MATTER: STRUCTURAL, MECHANICAL, AND THERMAL PROPERTIES

- 056101 Total ionizing dose effect of double-trench SiC MOSFET
ZHU Wenlu GUO Hongxia LI Yangfan MA Wuying ZHANG Fengqi BAI Ruxue ZHONG Xiangli LI Jifang CAO Yanhui JU Anan
- 056102 Construction of neural network potential for uranium-niobium alloy and molecular dynamics of its low-temperature aging behaviors
SU Rui LI Qingan GUAN Pengfei

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

- 057101 Regulation of effect of halogen and oxygen-containing element doping on negative differential resistance and spin-filtering of α -2-graphyne nanoribbon
LI Xiaobo LIU Shuaiqi HUANG Yan MA Yu DING Wence
- 057301 Effects of temperature cycling on leakage mechanism of through-silicon via insulation layer
REN Yunkun CHEN Si QIN Fei
- 057401 Process development and characteristics of YBCO thin film for radio frequency transmission wire preparation
TIAN Qingwen YUAN Pusheng YU Huiqin WANG Shuna LIU Xiaoyu LI Lingyun YOU Lixing
- 057402 Surface enhanced Raman spectroscopy effect and mechanism of vertically oriented MoS₂ nanosheet composite with Ag substrate
DAI Shuo LI Zhen ZHANG Chao YU Jing ZHAO Xiaofei WU Yang MAN Baoyuan
- 057601 Zero damping effect of magnetic bilayer in microwave resonant cavity
YIN Fan DAI Changjie ZHANG Ying YU Hailin XIAO Yang
- 057701 Finite element prediction and device performance of piezoelectric fiber composite based smart sensor
GAO Yukun ZHAO Jie ZHOU Jingjing ZHOU Jing

(Continued)

- 057801 An optimization method for terahertz metamaterial absorber based on multi-objective particle swarm optimization
WANG Yurong QU Weiwei LI Guilin DENG Hu SHANG Liping

INTERDISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY

- 058101 Microstructure structure and mechanical properties of coherent precipitation strengthened ultrahigh strength maraging stainless steel
YANG Yuxian WANG Zhenhua WANG Qing TANG Caiyu WAN Peng CAO Dahua DONG Chuang
- 058201 Improving electrochromic properties of tungsten trioxide by constructing gradient distribution oxygen vacancies through plasma treatment
JIANG Yihang CAO Fenghua LI Haomiao NIE Yongjie LI Guochang WEI Yanhui LU Guanghao LI Shengtao ZHU Yuanwei
- 058401 Various operating modes of optically controlled multi-gate thyristors
WANG Lingyun LIU Hongwei YUAN Jianqiang XIE Weiping LUAN Chongbiao LI Hongtao ZHANG Jiande CHEN Yi HE Yang LIU Xiaoli GAO Bin
- 058501 X-ray irradiation effects of carbon nanotube field-effect transistors
ZENG Tianxiang LI Jifang GUO Hongxia MA Wuying LEI Zhifeng ZHONG Xiangli ZHANG Hong WANG Songwen

GEOPHYSICS, ASTRONOMY, AND ASTROPHYSICS

- 059201 Observation and research on cosmic ray muons and solar modulation effect based on plastic scintillator detector
WANG Dexin ZHANG Rui YU Dekang NA Hui YAO Zhanghao WU Linghe ZHANG Suyalatu LIANG Tairan HUANG Meirong WANG Zhilong BAI Yu HUANG Yongshun YANG Xue ZHANG Jiawen LIU Mengdi MA Qiang YU Jing JI Xiuyan YU Yiliqi SHAO Xuepeng
- 059202 Full vector properties of angular momentum of cylindrical vector vortex beam propagating in free space
GAO Yujie LI Jinhong WANG Jing LIU Jinhong YIN Xiaojin

Color figures can be viewed in the online issue.



Online issue