

物 理 学 报

第 74 卷 第 14 期 2025 年 7 月 20 日

目 次

综述

- 148803 锂离子动力电池电化学建模进展及降阶方法研究 张艳岗 董泽庆 郑利锋 王凯 梁君飞

仪器与测量

- 148703 超快太赫兹散射型扫描近场光学显微镜
..... 王有为 马一航 王嘉毅 汪子权 饶馨予 代明聪 黄滋宇 吴晓君

总论

- 140201 匀强电场作用下含表面活性剂的液滴动力学行为 胡浩然 刘茜 彭江 柴振华
140202 基于双层运动模型的楼梯行人群体仿真 陈群 喻亚文
140301 分区级数解法在二维 Dirac 方程中的应用 孙松阳 朱嘉麟
140302 改进的关联源量子密钥分发 李思莹 朱顺 胡飞飞 黄昱 林旭斌 覃楚珺 曹渊 刘云
140303 基于超纠缠的三用户全连接量子网络
..... 刘圆凯 侯云龙 杨宜霖 侯刘敏 李渊华 林佳 陈险峰
140701 红外超连续辐射泵浦电光晶体产生的太赫兹辐射
..... 刘雨熙 周宇龙 邵烁婷 尉鹏飞 梁奇锋 王小同 唐桢波 况龙钰 胡广月
140702 大口径锥型玻璃管 X 射线透镜的设计与模拟 华陆 周泽贤 钟玉川 张金福 袁天语
史路林 王昭 陈宇鹏 王国东 陈燕红 金雪剑 雷瑜 吴晓霞 王瑜玉 孙天希 程锐 杨杰

基本粒子物理学与场

- 141201 基于光谱诊断和时域有限差分方法计算触发闪电电流与电磁场 ... 索煜航 申晓志 齐奇 张华明

核物理学

- 142101 强磁场与有限温度下色味锁夸克星的唯象模型 初鹏程 刘玉珩 刘鹤 刘宏铭 杨永杭

原子和分子物理学

- 143101 微结构表面几何特性对水蒸气凝结影响的分子动力学研究
..... 龚路远 魏鑫鼎 韩韬 郭亚丽 沈胜强

电磁学、光学、声学、传热学、经典力学和流体动力学

- 144101 基于深度学习的长波红外外电光栅加速器结构设计
..... 陈鹏博 王少义 张文博 温家星 吴玉迟 赵宗清 王度
144201 Rice-Mele 拓扑泵浦模型中的非绝热演化理论研究 张硕实 常名立 刘墨点 董建文
144202 超聚束压缩热态与压缩数态光场的高阶相干性 何力 赵洁 李红宇 郭晓敏 郭龔强
144203 参量驱动腔中的辐射特性 尚雪 曹斌芳 郭苗迪 贺志 周春晓
144204 全固态高功率深紫外皮秒激光器 欧佐元 徐思志
刘星 高瑜博 陈俊展 和星宇 卢浩天 吴宛昊 郭春雨 郭丽 吴旭 吕启涛 阮双琛
144205 拓扑选择性非厄米趋肤效应 **封面文章** 杨星 刘梦蛟 侯佳浩 李添悦 王淑明
144301 基于简正波强度匹配的浅海水平阵目标深度估计方法 ... 殷敬伟 尹家瑞 曹然 黄春龙 李理
144302 基于流声分离的亚声速射流能量输运特性分析 韩帅斌 罗勇 李虎 王益民 武从海

144303 超声溶栓中多气泡协同空蚀效应的数值分析 贾宇皓 张晓敏 赵志鹏 吴琮 张林林

气体、等离子体和放电物理

145101 应力对磁声发射和磁畴运动特性的影响 邱发生 曾宇帆 肖树坤 殷晓芳 郭朝阳

145201 双频磁化容性耦合氩/甲烷等离子体放电特性 殷桂琴 张蕾蕾 脱升

145202 延时可调的双波长激光与 Sn 靶作用的极紫外辐射特性
..... 王天泽 胡桢麟 何梁 黄铸 刘懿贤 付轺文 林楠 冷雨欣

凝聚物质: 结构、力学和热学性质

146801 WS₂-MoSe₂ 二维平面异质结界面原子结构的积分相位差分衬度成像
..... 蔡尘 孙华聪 李佳蔚 张广宇 白雪冬

凝聚物质: 电子结构、电学、磁学和光学性质

147101 自旋-轨道耦合玻色气体中集体激发动力学 郑鸿燕 原梓洲 渠晓旭 胥文雨 陈小龙

147301 不对称光热与光力协同作用实现等离激元圆二色光谱的选择性调控
..... 魏思雨 黄浩 马小云 黄海文 徐欣 王荣瑶

147302 石墨烯和二维超导体 NbSe₂ 层间拖拽效应 李渝豪 朱丽君 张弛 李林 曾长淦

147303 Heusler 合金 Co₂FeAl_xSi_{1-x} 跨尺度结构有序度调控及其对磁致伸缩性能的影响
..... 姚亮 芦光辉 杜杰 刘永昌 郝学奎 王文洪

147701 基于多模态谐振的宽频雨水压电俘能器设计 李昊 周晶晶 孙琪 陈文 周静

147801 液晶驱动高 Q 值准连续域束缚态动态调谐 杨斐 张炳林 盛苗苗 金露凡 姚建铨

物理学交叉学科及有关科学技术领域

148501 多晶硅发射极高速双极晶体管质子单粒子效应
..... 李培 韩承相 何子杰 董志勇 何欢 贺朝会 魏佳男

148502 光谱稳定的混合卤素蓝光钙钛矿 LED 设计 ... 冯继雨 刘敏 屈正国 赵东楠 李道鹏 史同飞

148701 基于现场可编程门阵列的高能效轻量化残差脉冲神经网络处理器实现
..... 侯悦 项水英 邹涛 黄志权 石尚轩 郭星星 张雅慧 郑凌 郝跃

148702 柔性呼吸传感技术的医疗级开发: 医学物理实现路径与临床肺功能数据验证
..... 杨璞琦 李轲轶 林桂阳 林益华 郑冠英 谢宝松 崔丽娜 刘向阳

148704 高能 X 射线 FLASH 放射治疗: 基于低气压电离室的束流监视器物理及性能
..... 赵继荣 羊奕伟 张毅 王诗岚 冯松

148801 Na 原子修饰的 B_n ($n = 3-10$) 团簇的储氢性能 荔海玲 郑小平 祁鹏堂 张娟

148802 双吸收层钙钛矿异质结策略提升全钙钛矿叠层太阳能电池的光伏性能
..... 袁翔 张子发 王明吉 何丹敏 鹿颖申 洪峰 蒋最敏 徐闰 王应民 马忠权 宋宏伟 徐飞

148901 城市移动流量模型的跨尺度比较方法 ... 张洋 石武 谭索怡 牟建红 周逸龙 余宏杰 吕欣

148902 基于加权圈比的复杂网络关键节点识别方法 谢涵臣 吴明功 温祥西 张洛瑜

(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. 14, July 20, 2025

CONTENTS

REVIEW

- 148803 Research on electrochemical modeling and order reduction methods for lithium-ion power batteries
ZHANG Yangang DONG Zeqing ZHENG Lifeng WANG Kai LIANG Junfei

INSTRUMENTATION AND MEASUREMENT

- 148703 Ultrafast terahertz scattering scanning near-field optical microscope
WANG Youwei MA Yihang WANG Jiayi WANG Ziquan RAO Xinyu DAI Mingcong HUANG Ziyu WU Xiaojun

GENERAL

- 140201 Dynamic behaviors of surfactant-containing droplets under a uniform electric field
HU Haoran LIU Xi PENG Jiang CHAI Zhenhua
- 140202 Simulation of pedestrian groups on stairs based on dual-layer motion model
CHEN Qun YU Yawen
- 140301 Solution of two-dimensional Dirac equation by sectioned series expansion method
SUN Songyang ZHU Jialin
- 140302 Improved source-correlated quantum key distribution
LI Siying ZHU Shun HU Feifei HUANG Yu LIN Xubin QIN Chujun CAO Yuan LIU Yun
- 140303 A three-user fully connected quantum network based on hyperentanglement
LIU Yuankai HOU Yunlong YANG Yilin HOU Liumin LI Yuanhua LIN Jia CHEN Xianfeng
- 140701 Terahertz radiation generated by infrared supercontinuum radiation pumped electro-optic crystal
LIU Yuxi ZHOU Yulong SHAO Shuoting WEI Pengfei LIANG Qifeng WANG Xiaotong TANG Huibo KUANG Longyu HU Guangyue
- 140702 Design and simulation of X-ray lens with large diameter conical glass tube
HUA Lu ZHOU Zexian ZHONG Yuchuan ZHANG Jinfu YUAN Tianyu SHI Lulin WANG Zhao CHEN Yupeng WANG Guodong CHEN Yanhong JIN Xuejian LEI Yu WU Xiaoxia WANG Yuyu SUN Tianxi CHENG Rui YANG Jie

THE PHYSICS OF ELEMENTARY PARTICLES AND FIELDS

- 141201 Calculation of triggered lightning current and electromagnetic fields based on spectral diagnosis and finite-difference time-domain method
SUO Yuhang SHEN Xiaozhi QI Qi ZHANG Huaming

NUCLEAR PHYSICS

- 142101 Phenomenological model of color-flavor-locked quark star under strong magnetic fields at finite temperatures
CHU Pengcheng LIU Yuheng LIU He LIU Hongming YANG Yonghang

ATOMIC AND MOLECULAR PHYSICS

- 143101 Molecular dynamics study on influence of geometric characteristics of microstructure surface on steam condensation
GONG Luyuan WEI Xinding HAN Tao GUO Yali SHEN Shengqiang

(Continued)

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

- 144101 Deep learning-based design of long-wave infrared dielectric grating accelerator structures
CHEN Pengbo WANG Shaoyi ZHANG Wenbo WEN Jiaxing WU Yuchi ZHAO Zongqing WANG Du
- 144201 Theoretical study of non-adiabatic evolution in Rice-Mele topological pumping model
ZHANG Shuoshi CHANG Mingli LIU Modian DONG Jianwen
- 144202 High-order coherence of super-bunching squeezed thermal states and squeezed number states of light fields
HE Li ZHAO Jie LI Hongyu GUO Xiaomin GUO Yanqiang
- 144203 Research of radiation characteristics in a parametrically driven cavity
SHANG Xue CAO Binfang GUO Miaodi HE Zhi ZHOU Chunxiao
- 144204 All-solid-state high-power deep ultraviolet picosecond laser
OU Zuoyuan XU Sizhi LIU Xing GAO Yubo CHEN Junzhan HE Xingyu LU Haotian WU Chonghao GUO Chunyu GUO Li WU Xu LUE Qitao RUAN Shuangchen
- 144205 Topological selective non Hermitian skin effect **COVER ARTICLE**
YANG Xing LIU Mengjiao HOU Jiahao LI Tianyue WANG Shuming
- 144301 A target depth estimation method in shallow water based on matched normal mode intensity
YIN Jingwei YIN Jiarui CAO Ran HUANG Chunlong LI Li
- 144302 Energy transport analysis of subsonic jet based on hydro-acoustic mode decomposition
HAN Shuaibin LUO Yong LI Hu WANG Yimin WU Conghai
- 144303 Numerical analysis of synergistic cavitation effect of multiple bubbles in ultrasound thrombolysis
JIA Yuhao ZHANG Xiaomin ZHAO Zhipeng WU Qiong ZHANG Linlin

PHYSICS OF GASES, PLASMAS, AND ELECTRIC DISCHARGES

- 145101 Influence of stress on magneto-acoustic emission and magnetic domain motion characteristics
QIU Fasheng ZENG Yufan XIAO Shukun YIN Xiaofang GUO Chaoyang
- 145201 Discharge characteristics of dual-frequency magnetized capacitively coupled Ar/CH₄ plasma
YIN Guiqin ZHANG Leilei TUO Sheng
- 145202 Characteristics of extreme ultraviolet emissions from interaction between delay-adjustable dual-wavelength laser and Sn target
WANG Tianze HU Zhenlin HE Liang HUANG Zhu LIU Yixian FU Liwen LIN Nan LENG Yuxin

CONDENSED MATTER: STRUCTURAL, MECHANICAL, AND THERMAL PROPERTIES

- 146801 Atomic structure imaging of WS₂-MoSe₂ two-dimensional plane heterojunction interface using integrated differential phase contrast method
CAI Chen SUN Huacong LI Jiawei ZHANG Guangyu BAI Xuedong

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

- 147101 Collective excitation dynamics in spin-orbit coupled Bose gases
ZHENG Hongyan YUAN Zizhou QU Xiaoru XU Wenyu CHEN Xiaolong
- 147301 Selective modulation of plasmonic circular dichroism spectra achieved by synergy of asymmetric optomechanical and photothermal effects in nano-plasmonic chiral structures
WEI Siyu HUANG Hao MA Xiaoyun HUANG Haiwen XU Xin WANG Rongyao
- 147302 Interlayer drag effect between graphene and two-dimensional superconductor NbSe₂
LI Yuhao ZHU Lijun ZHANG Chi LI Lin ZENG Changgan

(Continued)

- 147303 Control of cross-scale structural order of Heusler alloy $\text{Co}_2\text{FeAl}_x\text{Si}_{1-x}$ and its influence on magnetostriuctive properties
YAO Liang LU Guanghui DU Jie LAU Yongchang XI Xuekui WANG Wenhong
- 147701 Design of broadband rainwater piezoelectric energy harvester based on multimodal resonance
LI Hao ZHOU Jingjing SUN Qi CHEN Wen ZHOU Jing
- 147801 Dynamic tuning of high- Q quasi-bound states in continuum driven by liquid crystal
YANG Fei ZHANG Binglin SHENG Miaomiao JIN Lufan YAO Jianquan

INTERDISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY

- 148501 Proton single-event effects in high-speed polysilicon-emitter bipolar transistors
LI Pei HAN Chengxiang HE Zijie DONG Zhiyong HE Huan HE Chaohui WEI Jianan
- 148502 Compositional design of spectrally stable blue mixed-halide perovskite LEDs
FENG Jiyu LIU Min QU Zhengguo ZHAO Dongnan LI Daopeng SHI Tongfei
- 148701 Implementation of high-efficiency, lightweight residual spiking neural network processor based on field-programmable gate arrays
HOU Yue XIANG Shuiying ZOU Tao HUANG Zhiquan SHI Shangxuan GUO Xingxing ZHANG Yahui ZHENG Ling HAO Yue
- 148702 Medical-grade development of flexible respiratory sensing technology: Pathways for medical physics implementation and clinical pulmonary function data validation
YANG Yingqi LI Keyi LIN Guiyang LIN Yihua ZHENG Guanying XIE Baosong CUI Lina LIU Xiang Yang
- 148704 High-energy X-ray FLASH radiotherapy: Physics and performance study of beam monitoring based on low-pressure ionization chambers
ZHAO Jirong YANG Yiwei ZHANG Yi WANG Shilan FENG Song
- 148801 Hydrogen storage properties of Na-decorated B_n ($n = 3-10$) clusters
LI Hailing ZHENG Xiaoping QI Pengtang ZHANG Juan
- 148802 Dual-absorption-layer heterojunction strategy for enhancing photovoltaic performance of all-perovskite tandem solar cell
YUAN Xiang ZHANG Zifa WANG Mingji HE Danmin LU Yingshen HONG Feng JIANG Zuimin XU Run WANG Yingmin MA Zhongquan SONG Hongwei XU Fei
- 148901 Cross-scale comparison methods for urban mobility models
ZHANG Yang SHI Wu TAN Suoyi MOU Jianhong ZHOU Yilong YU Hongjie LU Xin
- 148902 A method of identifying key nodes in complex networks based on weighted cycle ratio
XIE Hanchen WU Minggong WEN Xiangxi ZHANG Mingyu

Color figures can be viewed in the online issue.



Online issue