

## 目次

## 综述

防暴动能弹钝性弹道冲击实验测试研究综述	汪 送(1)
智能航迹规划算法研究现状与展望	谢凯利,杨海涛,谢海平(8)
钛合金在兵器装备上的应用	陈京生,孙葆森(14)

## 装备理论与装备技术

高速射弹入水过程弹道与流体动力特性研究	郝 博,代 浩,吕 超(21)
侵彻过程中弹引系统的冲击传递特性研究	张冬梅,高世桥,李世中(27)
超空泡射弹侵彻间隔薄靶的数值模拟研究	李 恒,唐 奎,段 慧,冯 炜(35)
小尺寸破片应用于单兵武器的适用性研究	贺金金,梁增友,任 凯,梁福地,苗春壮,刘 洋(41)
火箭卫星舱壳体分离灵敏度分析与优化设计	葛 悦,王洪波,龚 旻,赵俊锋,高 峰,罗 波,牛 飞(46)
基于包络预测的动态阈值计层算法	戴政豪,高世桥,李泽章,张铭翔(53)
火工分离推杆分离特性研究	于 兵,相升海,闫利伟,杨艳羽,梁永潮(57)
寿命指数分布类型装备可靠性指标估计方法的应用分析	魏国东,俞 翔(63)
某型水下拖曳设备水动力仿真研究	周陈颖,任 杰,张 哲,赵昌方,仲健林(67)
小当量战斗部爆炸冲击波对有生目标的毁伤效应分析	李 川,陈海斌,张 亮,聂丛林,何有为(73)
燃气舵推矢装置的改进设计及其气动特性分析	孙宇航,杨 晨(77)
单破片对导弹舱段毁伤的易损性快速分析方法	于 滨,李翔宇,卢芳云(82)
一种基于 DCNN-LSTM 混合模型的 RUL 预测方法	温海茹,陈雯柏(87)
气缸式尾翼气缸内压力及影响因素分析	任 明,曾 稼,陈 江,熊国松,丁方超,张镇锋,李 中(93)
某单兵电视侦察弹弹道设计	冯 勃,张志彪,汪家勇(98)
防暴弹定高空爆控制系统研究	庄维伟,刘加凯,潘国强,张金涛(104)
不同间隙下的炮尾闭锁面的疲劳寿命计算	杨明光,曹广群,李煥斌,刘鹏科,徐宏英(108)
空间对接电磁锁紧机构研究	楼雨涵,解志坚,杨 臻,王昊东(113)
基于 CFD 的航炮吊舱偏流流场分析	李善吉,王惠源,黄少保,王志杰(118)
模块化聚能切割装置设计及效能评估	陈治民,郭三学(123)
车辆荷载作用下的装配式钢桁架桥应力分析与试验研究	邓 海,许宏伟(127)
基于改进 NSGA2 算法的航空燃油泵叶轮优化设计	白永明,陶 艺,吴迎春,张小波,王宏建(132)

## 基础理论与应用研究

多物理场作用下身管应力场及裂纹尖端强度因子分析  
车载综合电力系统大信号失稳预测  
爆炸载荷作用下含预制损伤膜片力学响应特性  
基于多元信息融合的小波降噪质量综合评估指标  
基于粒子群算法的磁流变缓冲器磁路设计研究  
基于闭式解算法的粘弹性振子系统阻尼效应分析  
尖拱细长旋成体低速大攻角绕流数值模拟  
基于小波神经网络的地铁轴承故障诊断方法  
城市电力网络站点重要度综合评估方法  
近地爆炸冲击波传播特性数值模拟与应用

王为介,曲 普,李 强,李 池(138)  
高 强,袁 东,刘春光,魏曙光(143)  
李彦超,徐 鹏,蔡宣明,李海涛,秦国华(149)  
邵 旋,康兴无,王旭平,袁晓静,路国超(155)  
韩晓明,张 超,许桎璋,李 强,李侃伟(161)  
孙 宝,张文超,李占龙,秦 园(166)  
张浩南,李国辉,徐 宇(171)  
徐欣怡,徐永能,任宇超(177)  
韩 林,赵旭东,熊婧怡(182)  
曹 涛,孙 浩,周 游,罗 赓,孙吉伟(187)

## 化学工程与材料科学

不同类型碳源爆轰合成聚晶金刚石特性研究  
海胆状 LLM-105 的制备与性能研究  
高压光传感材料  $\text{SrB}_4\text{O}_7:\text{Sm}^{2+}$  的制备及其发光性能  
静动爆冲击波数值仿真分析  
固体火箭发动机用 W8Cu 钨渗铜喉衬抗烧蚀性研究

张世潇,仝 毅,商士远,黄风雷(192)  
夏家锦,索志荣,李尚斌,黄 明,王敬凯,耿文静(197)  
刘永刚,陈百利(203)  
王良全,商 飞,孔德仁(208)  
林冰涛,余小波,张保红,郭颖利,刘仲位,孙晓霞,褚 宏(214)

## 信息科学与控制工程

地磁矢量信息测量安装角的快速标定算法  
基于新息的 SINS/DVL 组合导航自适应滤波算法  
基于 SLA 高阶累积量的远近场混合源定位算法  
多通道弹丸破片测速系统关键技术设计与应用  
空间密集目标的群分割算法研究  
多智能体备用领导者避障方法  
考虑影响方式的雷达测高误差因素表征方法  
MLU100 智能加速卡的地面无人平台应用研究  
增强现实在装甲装备基层级维修中的应用  
基于关联数据技术的机构知识库构建与服务

高丽珍,张莺莺,张晓明,薛羽阳(220)  
李万里,陈明剑,张伦东,陈 锐(225)  
温斐旻,杨瑞峰,郭晨霞,葛双超(230)  
杨文福,陈员义,周祥明,徐华银(235)  
韩蕾蕾,周 璐(240)  
田宝国,吴尚烨(247)  
王永攀,常春贺,苏号然,蔡志成(253)  
安旭阳,苏治宝,杜志岐,李兆冬(259)  
张 雷,马金盾,郭理彬,张 杰(268)  
郭卫兵,臧莉娟(275)

# JOURNAL OF ORDNANCE EQUIPMENT ENGINEERING

Vol. 41    No. 12 (Sum. No. 269)    Dec. 2020

## CONTENTS

<b>Review on Experimental Tests of Anti-Riot Kinetic Projectiles Blunt Ballistic Impact</b>	WANG Song(1)
<b>Research Status of Intelligent Track Planning Algorithm</b>	XIE Kaili, YANG Haitao, XIE Haiping(8)
<b>Titanium alloysforordnanceequipmentapplications</b>	CHEN Jingsheng, SUN Baosen(14)
<b>Research on Water Entry Trajectory and Hydrodynamic Characteristics of High-Speed Projectiles</b>	HAO Bo, DAI Hao, LYU Chao(21)
<b>Study on Impact Transfer Characteristics of Projectile System During Penetration</b>	ZHANG Dongmei, GAO Shiqiao, LI Shizhong(27)
<b>Numerical Simulation on Penetration of Supercavitating Projectiles into Spaced Thin Targets</b>	LI Heng, TANG Kui, DUAN Hui, et al(35)
<b>Study on Applicability of Small Size Fragments to Individual Weapons</b>	HE Jinjin, LIANG Zengyou, REN Kai, et al(41)
<b>Rocket Satellite Cabin Separation Sensitivity Analysis and Optimization</b>	GE Yue, WANG Hongbo, GONG Min, et al(46)
<b>Dynamic Threshold Layer Count Algorithm Based on Envelope Prediction</b>	DAI Zhenghao, GAO Shiqiao, LI Zezhang, et al(53)
<b>Study on Separation Characteristics of Pyrotechnic Separation Pushing Rod</b>	YU Bing, XIANG Shenghai, YAN Liwei, et al(57)
<b>Application Analysis of Reliability Index Estimation Method for Exponential Distribution Type Equipment</b>	WEI Guodong, YU Xiang(63)
<b>Research on Hydrodynamic Simulation of a Type of Underwater Towing Equipment</b>	ZHOU Chenying, REN Jie, ZHANG Zhe, et al(67)
<b>Analysis on Damage of Small Equivalent Warhead Blast Wave to Living Target</b>	LI Chuan, CHEN Hai-bin, ZHANG Liang, et al(73)
<b>Improvement and Aerodynamic Characteristics Analysis of Jet Vane Design</b>	SUN Yuhang, YANG Chen(77)
<b>Fast Vulnerability Analysis Method of Missile Sections Under the Attack of Fragment</b>	YU Bin, LI Xiangyu, LU Fangyun(82)
<b>RUL Prediction Method Based on DCNN-LSTM Hybrid Model</b>	WEN Hairu, CHEN Wenbai(87)
<b>Cylinder Pressure Analysis of Cylinder-Open Fin</b>	REN Ming, ZENG Jia, CHEN Jiang, et al(93)
<b>Trajectory Design of TV Reconnaissance Cluster Munition for Individual Soldier</b>	FENG Bo, ZHANG Zhibiao, WANG Jiayong(98)
<b>Research on Fixed-Point Air-Burst Control System of Riot Ammunition</b>	ZHUANG Weiwei, LIU Jiakai, PAN Guoqiang, et al(104)
<b>Fatigue Life Calculation of Breech Locking Surface Under Different Clearances</b>	YANG Mingguang, CAO Guangqun, LI Huanbin, et al(108)
<b>Research on Space Docking Electromagnetic Locking Mechanism</b>	LOU Yuhan, XIE Zhijian, YANG Zhen, et al(113)
<b>Analysis of Deflection Flow Fields of Aircraft Gun Pod Based on CFD</b>	LI Shanji, WANG Huiyuan, HUANG Shaobao, et al(118)
<b>Design and Performance Evaluation of Modular Energy-Concentrating Cutting Device</b>	CHEN Zhimin, GUO Sanxue(123)
<b>Stress Analysis of Fabricated Steel Truss Bridge Under Vehicle Load with Numerical Caculation and Experimental Research</b>	DENG Hai, XU Hongwei(127)
<b>Optimization Design of Aviation Fuel Pump Impeller Based on Improved NSGA2 Algorithm</b>	BAI Yongming, TAO Yi, WU Yingchun, et al(132)

# JOURNAL OF ORDNANCE EQUIPMENT ENGINEERING

Vol. 41 No. 12(Sum. No. 269) Dec. 2020

Stress Field and Crack Tip Intensity Factor Analysis of Barrel Under Multi Physical Fields	WANG Weijie, QU Pu, LI Qiang, LI Chi(138)
Large-Signal Instability Prediction of Vehicular Integrated Power System	GAO Qiang, YUAN Dong, LIU Chunguang, et al(143)
Mechanical Response Characteristics of Prefabricated Damaged Diaphragm Under Explosive Loading	LI Yanchao, XU Peng, CAI Xuanming, et al(149)
Comprehensive Evaluation Index of Wavelet Denoising Quality Based on Multi-Information Fusion	SHAO Xuan, KANG Xingwu, WANG Xuping, et al(155)
Research on Magnetic Circuit Design of Magnetorheological Buffer Based on Particle Swarm Optimization	HAN Xiaming, ZHANG Chao, XU Zhizhang, et al(161)
Damping Effect Analysis of Viscoelastic Vibration Based on Closed Solution Algorithm	SUN Bao, ZHANG Wenchao, LI Zhanlong, et al(166)
Numerical Simulation of Flow Around a Pointed Arch Slender Body at Low Velocity and High Angle of Attack	ZHANG Haonan, LI Guohui, XU Yu(171)
New Wavelet Neural Network Method for Fault Diagnosis of Metro Bearings	XU Xinyi, XU Yongneng, REN Yuchao(177)
Comprehensive Method for Evaluating the Importance of Urban Power Network Station	HAN Lin, ZHAO Xudong, XIONG Jingyi(182)
Numerical Simulation and Application of Propagation Characteristics of Shock Wave Near Ground Explosion	CAO Tao, SUN Hao, ZHOU You, et al(187)
Study on Characteristics of Detonation Polycrystalline Diamond Synthesized with Different Carbon Sources	ZHANG Shixiao, TONG Yi, SHANG Shiyuan, et al(192)
Study on Preparation and Properties of Sea-Urchin-Shaped LLM-105	XIA Jiajin, SUO Zhirong, LI Shangbin, et al(197)
Preparation and Luminescence Properties of High-Pressure Optical Sensing Material $\text{SrB}_4\text{O}_7\text{:Sm}^{2+}$	LIU Yonggang, CHEN Baili(203)
Numerical Simulation Analysis of Static and Dynamic Shock Waves	WANG Liangquan, SHANG Fei, KONG Deren(208)
Study on Ablation Resistance of W8Cu Tungsten Infiltrated Copper Nozzle Throat Liner for SRM	LIN Bingtao, YU Xiaobo, ZHANG Baohong, et al(214)
Fast Calibration Algorithm for Geomagnetic Vector Information Measurement Installation Angle	GAO Lizhen, ZHANG Yingying, ZHANG Xiaoming, et al(220)
Adaptive Kalman Filter Based on Innovation Sequence for SINS/DVL Integrated Navigation	LI Wanli, CHEN Mingjian, ZHANG Lundong, et al(225)
Hybrid Source Location Algorithm Based on SLA High Order Cumulants	WEN Feimin, YANG Ruifeng, GUO Chenxia, et al(230)
Design and Application of the Multichannel Speed Measurement System for Projectile Fragment	YANG Wenfu, CHEN Yuanyi, ZHOU Xiangming, et al(235)
Research on Group Partitioning Algorithm of Space Dense Targets	HAN Leilei, ZHOU Lu(240)
Obstacle Avoidance of Multi-Agent System with Standby Leader	TIAN Baoguo, WU Shangye(247)
Methods of Factor Characterization About Radar Height Finding Error Considering Influence Modes	WANG Yongpan, CHANG Chunhe, SU Haoran, et al(253)
Application Research of MLU100 Intelligent Acceleration Card for Unmanned Ground Platform	AN Xuyang, SU Zhibao, DU Zhiqi, et al(259)
Application of Augmented Reality in Basic Maintenance of Armored Equipment	ZHANG Lei, MA Jindun, GUO Libin, et al(268)
Construction and Services of Institutional Repository Based on Linked Data	GUO Weibing, ZANG Lijuan(275)