

## 目次

## 综述

|                      |                         |
|----------------------|-------------------------|
| 复合固体推进剂蠕变分析研究进展      | 强洪夫,冯帅星,杨正伟,王学仁(1)      |
| 防暴动能弹发展现状及趋势分析       | 汪 送(6)                  |
| 防暴弹药任务安全性研究综述        | 翟浩龙,崔晓萍(12)             |
| 负重轮轻质材料的应用及其制造工艺研究进展 | 倪斌庆,曾 智,马秋成,张亚新,张志广(18) |

## 装备理论与装备技术

|                             |                                 |
|-----------------------------|---------------------------------|
| 固支钢板在爆炸与均布载荷耦合作用下的破坏        | 李旭东,尹建平,赵鹏铎,王 琪,李 茂,张 磊,焦晓龙(26) |
| 步枪弹对有防护明胶靶标钝击作用传递模型研究       | 姜 荃,温焱珂,张俊斌,徐 诚,黄雪鹰(31)         |
| 路面激励对火箭炮行进间发射控制的影响研究        | 孙志群,李 强,袁 卫,曾正森,李世康(37)         |
| 基于 STPA 的鱼雷发射安全性分析          | 秦 楠,马 亮,周 杰,魏 勇(42)             |
| 膛线形式对某大口径火炮炮口振动影响分析         | 郭俊行,丁宏民,樵军谋(47)                 |
| 基于指数收敛观测器的协调臂自适应滑模控制        | 潘润超,李志刚(53)                     |
| 基于 EHA 的弹簧蓄能机载导弹弹射式发射装置优化设计 | 王殿宇,侯 明,张 兵,汉 田,盛子豪(58)         |
| 高速弹体侵彻冰材料过程数值模拟研究           | 王英霖,王 健,诸庆生(62)                 |
| 钻地弹侵彻发射井上盖毁伤研究              | 刘 锐,王 健(68)                     |
| 设计参数对负泊松比结构抗爆性能的影响研究        | 陶晓晓,孙晓旺,石 文,王显会,罗小丽(74)         |
| 考虑环境因素影响下某机枪抛壳可靠性分析         | 袁克斌,方 峻(80)                     |
| 杆式射流侵彻移动靶数值模拟               | 曹 鹏,张国伟,乔通通,康斌会(86)             |
| 舰船防护结构抗近爆毁伤作用数值模拟           | 吴华鑫,丁剑锋,程瑞琪,方 俊,郑亚雄(91)         |
| 内锥型空心弹阻塞喉径面积比的仿真研究          | 全 鑫,张红艳,马铁华,张 瑜,武耀艳(97)         |
| 捷联星光复合制导修正方法研究              | 张 青,王胜永,傅 瑜,王 勇,林海奇(102)        |
| 隔板参数对双层药型罩形成聚能射流的影响         | 贾晓玲,袁晓彤,惠巧鸽,贺浩锋(108)            |
| 低空干扰弹气动仿真与优化                | 鲜 敏,郭向向,田建立,邱江平(113)            |
| 密度跃层对潜艇操纵运动的影响及应对措施研究       | 张建华,黄海峰,胡坤,刘广旭(118)             |
| 舰载雷达变频方式及变频使用策略研究           | 刘冬利,兰 慧,侯建强(123)                |

## 基础理论与应用研究

|                |                          |
|----------------|--------------------------|
| 近距空中支援打击目标选择研究 | 董文洪,高 宇,王宗波,刘 磊,邢 丽(128) |
|----------------|--------------------------|

嵌入式平台下红外图像坦克目标识别的实现方法

王磊,关英,孟志敏,郝永平,徐九龙(132)

轴向运动悬臂梁横向振动理论及实验研究

段应昌,王建平,刘虎,万银忠(138)

基于 BP 神经网络的潜地导弹落点参数计算方法

田春军(145)

基于 SVM 的激光雷达飞机尾涡识别方法

王玄,潘卫军,韩帅,吴郑源(150)

基于神经网络集成的阵地工程效能评估

曹林,陈亮,马小博(156)

某型装甲车辆排烟红外辐射试验研究

赵耀,骆清国,邱绵浩,张玉飞,鲁俊(162)

基于灰色 LS-SVM 的装备器材需求预测模型

贾琦,杨帆,王铁宁(170)

爆炸物导线切割器剪切过程数值模拟

龚建华,张乾波,吴燕,贾丰(175)

## 信息科学与控制工程

一种水下航行体纵向运动控制方法研究

丁浩,黄波,崔沁青(179)

多航天器集中事件触发分组姿态协同控制

王帅磊,周绍磊,祁亚辉,张瑞雪(183)

基于复合控制的发电机组协调控制方法研究

刘春光,徐浩轩,马晓军(188)

基于 FMCW 的导弹脱靶量测量系统设计与仿真

毕月,冯玉光(193)

非接触式涡轮叶片温度测量无线供电系统研究

赵阳,马游春,刘鹏媛,何巧(198)

基于 GPS/UWB 技术的无缝定位平台设计

连小勇,王茂森,戴劲松(203)

弹仓的 RBF 神经网络自适应滑模控制

王思杰,李志刚,孙玲庆(208)

一种基于改进时窗法的爆炸冲击波检测方法

艾斯煜,杜博军,王军(213)

## 机械制造与检测技术

外肢体机器人的运动分析与控制仿真

史亦凡,管小荣,李回滨,李仲(218)

某火炮翻板机构回转臂的结构优化设计

孙玲庆,李志刚,王思杰(224)

基于 BP 算法的热障涂层厚度反演研究

谢建红,石剑,习小文,肖力伟,宋凯(228)

基于 AMEsim 的机载冷凝器换热性能数值模拟

张永宏,刘宸旭(233)

## 光学工程与电子技术

原向反射式大靶面光幕探测灵敏度分布特性

高丰佳,董涛,谭林秋,陈丁,王利(238)

航空发动机轮盘结构可靠性全局灵敏度分析

张屹尚,陈健(244)

基于 PSO-NARX 网络的涡轴发动机稳态模型辨识

董庆,李本威,钱仁军,滕怀亮,张赞(250)

基于改进 YOLOv3 的装甲车辆检测方法

丛眸,张平,王宁(258)

# JOURNAL OF ORDNANCE EQUIPMENT ENGINEERING

Vol. 42 No. 4( Sum. No. 273 ) Apr. 2021

## CONTENTS

|  |   |
|--|---|
| Research Progress in Creep Properties of Composite Solid Propellant  | QIANG Hongfu, FENG Shuaixing, YANG Zhengwei, et al(1) |
| Analysis of Development Status and Trend of Anti-Riot Kinetic Energy Projectile  | WANG Song(6)  |
| Review of Research on Mission Safety of Anti-Riot Ammunition   | ZHAI Haolong, CUI Xiaoping(12)                        |
| Research Progress on the Application of Lightweight Materials for Road Wheels and Their Manufacturing Processes            | NI Binqing, ZENG Zhi, MA Qiucheng, et al(18)          |
| Failure of Clamped Steel Plates Under Local Explosion and Uniformly Distributed Load                                       | LI Xudong, YIN Jianping, ZHAO Pengduo, et al(26)      |
| Research on Transfer Model of Rifle Projectile Blunt Impact on Protected Gelatin Target                                    | JIANG Quan, WEN Yaoke, ZHANG Junbin, et al(31)        |
| Study on Effect of Road Excitation on Rocket Launch Control Between Travels  | SUN Zhiqun, LI Qiang, YUAN Wei, et al(37)             |
| Safety Analysis of Torpedo Launching Based on STPA   | QIN Nan, MA Liang, ZHOU Jie, et al(42)                |
| Effect of Rifling Type on Muzzle Vibration of a Large Caliber Gun-Howitzer   | GUO Junhang, DING Hongmin, QIAO Junmou(47)            |
| Adaptive Sliding Mode Control of Projectile Coordination Arm Based on Disturbance Observer                                 | PAN Runchao, LI Zhigang(53)                           |
| Optimal Design of Spring Energy Storage Ejection Mechanism of Airborne Missile Based on EHA                                | WANG Dianyue, HOU Ming, ZHANG Bing, et al(58)         |
| Numerical Simulation of High Speed Projectile Penetrating Ice Material   | WANG Yinglin, WANG Jian, ZHU Qingsheng(62)            |
| Numerical Simulation for Missile Launching Silo Upper Cover of Earth Penetrating Weapon                                    | LIU Rui, WANG Jian(68)                                |
| Influence of Design Parameters on Anti-Explosion Performance of Honeycomb Sandwich Structure with Negative Poisson's Ratio | TAO Xiaoxiao, SUN Xiaowang, SHI Wen, et al(74)        |
| Reliability Analysis of a Machine Gun Cartridge Case Ejection Considering Environmental Factors                            | YUAN Kebin, FANG Jun(80)                              |
| Numerical Simulation of Rod Jet Penetration Moving Target  | CAO Peng, ZHANG Guowei, QIAO Tongtong, et al(86)      |
| Numerical Simulation of Near Explosion Damage Effect on Ship Protective Structure  | WU Huaxin, DING Jianfeng, CHENG Ruiqi, et al(91)      |
| Simulation Research on Critical Area Ratio of Throat to Entrance of Inner Conical Hollow Projectile Under Choke Flow       | QUAN Xin, ZHANG Hongyan, MA Tiehua, et al(97)         |
| Research on Correction Method for Stellar/SINS Combined Guidance   | ZHANG Qing, WANG Shengyong, FU Yu, et al(102)         |
| Influence of Wave-Shaper Parameters on Shaped Charge Jet Formed by Double Liner  | JIA Xiaoling, YUAN Xiaotong, XI Qiaoge, et al(108)    |
| Aerodynamic Simulation and Shape Optimization of the Low-Altitude Jamming Projectile                                       | XIAN Min, GUO Xiangxiang, TIAN Jianli, et al(113)     |
| Study on Influence of Pycnocline on Submarine Maneuverability and Countermeasures  | ZHANG Jianhua, HUANG Haifeng, HU Kun, et al(118)      |
| Research on Frequency Conversion Strategy and Mode of Shipborne Radar  | LIU Dongli, LAN Hui, HOU Jianqiang(123)               |

# JOURNAL OF ORDNANCE EQUIPMENT ENGINEERING

Vol. 42 No. 4 (Sum. No. 273) Apr. 2021

|   |   |
|---|---|
| Close Air Support Target Selection Study .....  | DONG Wenhong, GAO Yu, WANG Zongbo, et al(128)     |
| Realization of Target Recognition of Infrared Image Tank Based on Embedded Platform .....   | WANG Lei, GUAN Ying, MENG Zhimin, et al(132)      |
| Theoretical and Experimental Study on Transverse Vibration of Axially Moving Cantilever Beam .....                                | DUAN Yingchang, WANG Jianping, LIU Hu, et al(138) |
| Calculation Method of Impact Point Parameter Based on BP Neural Network for Submarine-Launched Ballistic Missile .....            | TIAN Chunjun(145)                                 |
| Identification of Aircraft Wake Vortex Using Lidar Based on SVM .....   | WANG Xuan, PAN Weijun, HAN Shuai, et al(150)      |
| Effectiveness Evaluation of Position Engineering Based on Neural Network Ensemble .....   | CAO Lin, CHEN Liang, MA Xiaobo(156)               |
| Experimental Study on Infrared Radiation of Exhaust Gas From an Armored Vehicle .....   | ZHAO Yao, LUO Qingguo, QIU Mianhao, et al(162)    |
| Equipment Demand Forecasting Model Based on Grey LS-SVM .....   | JIA Qi, YANG Fan, WANG Tiening(170)               |
| Numerical Simulation of IED Wires Cutter Based on ANSYS/LS-DYNA .....   | GONG Jianhua, ZHANG Qianbo, WU Yan, et al(175)    |
| Study on Control Method of Underwater Vehicle's Longitudinal Motion .....   | DING Hao, HUANG Bo, CUI Qingqing(179)             |
| Multi-Spacecraft Centralized Event-Triggered Group Attitude Coordinated Control .....   | WANG Shuailei, ZHOU Shaolei, QI Yahui, et al(183) |
| Research on Coordinated Control Method of Generator Set Based on Compound Control Strategy .....                                  | LIU Chunguang, XU Haoxuan, MA Xiaojun(188)        |
| Design and Simulation of Missile Miss Distance Measurement System Based on FMCW .....   | BI Yue, FENG Yuguang(193)                         |
| Research on Wireless Power Supply System of Non-Contact Turbine Blade Temperature Measurement .....                               | ZHAO Yang, MA Youchun, LIU Pengyuan, et al(198)   |
| Design of Seamless Positioning Monitoring Platform Based on GPS/UWB Technology .....  | LIAN Xiaoyong, WANG Maosen, DAI Jinsong(203)      |
| RBF Neural Network Adaptive Sliding Mode Control of Magazine .....  | WANG Sijie, LI Zhigang, SUN Lingqing(208)         |
| Test Method of Blast Vibration Wave Based on Improved Time Window Method .....  | AI Siyu, DU Bojun, WANG Jun(213)                  |
| Motion Analysis and Control Simulation of External Limb Robot .....   | SHI Yifan, GUAN Xiaorong, LI Huibin, et al(218)   |
| Structural Optimization Design of Swing Arm of Certain Artillery Flap Mechanism .....   | SUN Lingqing, LI Zhigang, WANG Sijie(224)         |
| Research on Inversion of Thermal Barrier Coating Thickness Based on BP Neural Network .....                                       | XIE Jianhong, SHI Jian, XI Xiaowen, et al(228)    |
| Numerical Simulation of Heat Transfer Performance of Airborne Condenser Based on AMESim .....                                     | ZHANG Yonghong, LIU Chenxu(233)                   |
| Distribution Characteristics of Detection Sensitivity of Original Reflection-Based Light Screen with a Large Detection Area ..... | GAO Fengjia, DONG Tao, TAN Linqiu, et al(238)     |
| Global Sensitivity Analysis for Turbo-Engine Disk Structures with Uncertainties Based on Failure Probability .....                | ZHANG Yishang, CHEN Jian(244)                     |
| Steady-State Model Identification of Turboshift Engine Based on PSO-NARX Network .....  | DONG Qing, LI Benwei, QIAN Renjun, et al(250)     |
| Improved YOLOv3 Method for Armored Vehicles Object Detection .....  | CONG Mou, ZHANG Ping, WANG Ning(258)              |