

中文核心期刊

CSCD核心期刊

中国科技核心期刊

RCCSE中国核心学术期刊

ISSN 2096-2304

1213/TJ



Q K 2 2 0 2 8 6 0

# 兵器装备工程学报

## Journal of Ordnance Equipment Engineering



ISSN 2096-2304



12>

9 772096 230210



## 目 次

### 综述

- 雷达/红外复合制导空舰导弹搜捕问题综述 李海军,魏嘉彧,牟俊杰,姜 涛,刘崇屹(1)
- 国外镁合金装甲研究发展 陈京生,张艳琴,李 清,田欣幸,郎玉婧,孙葆森(7)
- 实现双基系推进剂低燃速的调控技术研究进展 张国辉,赵凤起,徐司雨,李 冰,吴瑞强(16)
- 丁羟复合推进剂过载燃烧研究进展 李 猛,赵凤起,张国辉,姚志成,李 武(23)
- 固体推进剂损伤多尺度模拟研究进展 庞维强,周 刚,王 可,李 焕(32)
- 环境效应检测与评价中的图像识别技术综述 陈星昊,舒 畅,黄 伦,李念林(44)
- 压装不敏感炸药相关技术最新进展 张为鹏,郭惠丽,邓雅静,黄亚峰,金鹏刚(52)
- 基于深度学习的舰船目标检测技术综述 李晨瑄,胥辉旗,钱 坤,邓博元,冯泽钦(57)
- 烟幕弹对制导弹药的干扰效能评估现状 郭爱强,高欣宝,李天鹏(64)
- 小口径穿甲弹防空反导技术现状与发展 焦延博,欧阳稠,罗文敏,王清清(72)
- 无人机自组网 GPSR 路由协议研究 祝 经,周新力,宋斌斌,王程民(81)

### 装备理论与装备技术

- 三脚枪架架腿截面形状对射击稳定性影响研究 杨程远,周克栋,刘 强,陆 野(87)
- 侵彻多层间隔靶板装药损伤特性研究 张萌昭,周 涛,郭洪福,沈 飞(92)
- 基于拔销器锁定的飞行器气动控制面解锁控制方法 姚 旺,赵晓宁,周国峰,孙 峥,雷 豹(98)
- 机 - 电 - 液馈能悬挂系统性能分析 张伟杰,汪国胜,郭 勇(103)
- 反潜鱼雷战斗部对典型潜艇目标毁伤效应研究 王 玉,卢 煦,张方方,宋佳平(112)
- 横流扰动下的鱼雷超空泡及水动力特性研究 李海东,齐江辉,吴述庆(117)
- 爆炸冲击波作用下抗爆传递窗的力学响应研究 向 召,戴开达,陈鹏万,吕智星,武 锋,张 鹏,张珊珊(123)
- 万瓦级舰载激光武器反无人机作战效力研究 徐粲然,孙世岩,余 博,周锦锋(129)
- 对移动目标射击自动校正方法研究 鄢砚军,彭志召,杨海丰(135)
- 双向曲率药型罩受力及两点起爆误差分析 刘 杰,陈 曜,杜忠华(141)
- 履带装备行动部分智能调整装置设计与实现 李 兵,唐 昊,邢炜焱,李 磊(147)

## 基础理论与应用研究

- 基于 SBFE 虚粒子边界的结构入水数值模拟 李上明,赵梓斌(153)
- 高速冲击下高能发射药力学行为尺寸效应研究 刘计划,何昌辉,周敬,张瑞华,赵宏立,王琼林(159)
- 软硬段结合双层复合结构包覆  $\varepsilon$ -HNIW 降噪研究 向俊舟,郭学永,吴成成,魏华(164)
- 钢混结构靶标数字化快速建模方法研究 王良全,刘建荣,商飞,孔德仁(170)
- 多控制面同向偏转对前掠翼静气弹特性影响研究 赵希玮,苏新兵,张钧奕,王振(176)
- 基于水平时谐电偶极子模型的舰船轴频磁场传播特性分析 庞鑫,刘忠乐,文无敌,林朋飞,林嘉,唐琼婕,史润泽(183)
- 侵彻弹体尾部联结螺钉失效的影响因素 汪衡,王昭明,刘俞平,顾振中(188)
- 基于 AR 技术的对抗训练系统设计构想 邵伟,许仁杰,谭亚新,何天鹏(194)
- 基于相似度因子的直升机系统定检周期优化技术 宋海靖,焦毅(198)
- 压缩感知中测量矩阵筛选的等值线图和优化的适用性 吴小龙,程涛,李德高,吴艳(203)
- 基于改进 Apriori 算法的地铁故障关联规则挖掘 刘文雅,徐永能(210)
- 用于移动式供电的永磁同步发电机优化设计 曾繁琦,卜建国,袁晓静,王旭平,张泽(216)

## 信息科学与控制工程

- 基于下肢肌张力感知的痉挛特征提取算法研究 汪步云,吴臣,魏壮壮,张振,许德章(223)
- 基于能量评估的弹载磁强计校准方法 闫小龙,于天鹏,范旭,朱宜家,陈国光,田晓丽(233)
- 弱通讯条件下水下航行器编队行为分析 吕达,苏浩秦,郭明禹,张子俊,卢曼曼(239)
- 基于优化 KAZE 算法的图像配准方法 李培华(248)
- 基于 GPI 的三自由度直升机系统姿态控制研究 王玲玲,毋飞龙(254)

## 化学工程与材料科学

- 粘结剂种类和含量对 HMX 基 PBX 烤燃响应特性的影响研究 乔炳旭,李小东,燕翔,牛昶尧,宋昌贵(261)
- 激光引信探测目标回波特性研究 陈松,张晓倩,范秋亚(268)

# JOURNAL OF ORDNANCE EQUIPMENT ENGINEERING

Vol. 42 No. 12 (Sum. No. 281) Dec. 2021

## CONTENTS

<b>Overview on Acquisition of Radar/infrared Composite Guidance Air-to-Ship Missile</b>	..... <i>LI Haijun, WEI Jiayu, MOU Junjie, et al(1)</i>
<b>Research and Development of Magnesium Alloy Armor Abroad</b>	..... <i>CHEN Jingsheng, ZHANG Yanqin, LI Qing, et al(7)</i>
<b>Research Progress on Control Technology of Low Burning Rate for Double Base Propellants</b>	..... <i>ZHANG Guohui, ZHAO Fengqi, XU Siyu, et al(16)</i>
<b>Research Progress on Combustion Behavior of HTPB Propellant Under Acceleration Load</b>	..... <i>LI Meng, ZHAO Fengqi, ZHANG Guohui, et al(23)</i>
<b>Multi-Scale Simulation Developments of Solid Propellant Damage</b>	..... <i>PANG Weiqiang, ZHOU Gang, WANG Ke, et al(32)</i>
<b>Image Recognition Technology in Detection and Evaluation of Environmental Effect</b>	..... <i>CHEN Xinghao, SHU Chang, HUANG Lun, et al(44)</i>
<b>Latest Trends of Pressed Insensitive Explosives Related Technologies</b>	..... <i>ZHANG Weipeng, GUO Huili, DENG Yajing, et al(52)</i>
<b>Survey of Ship Detection Technology Based on Deep Learning</b>	..... <i>LI Chenxuan, XU Huiqi, QIAN Kun, et al(57)</i>
<b>Current Situation of Smoke Screen Jamming Effectiveness Evaluation on Guided Munitions</b>	..... <i>GUO Aiqiang, GAO Xinbao, LI Tianpeng(64)</i>
<b>Present Situation and Development of Air Defense and Antimissile of Small Caliber Armour-Piercing Projectile</b>	..... <i>JIAO Yanbo, OU Yangzhou, LUO Wenmin, et al(72)</i>
<b>Research on GPSR Routing Protocol of UAV Ad Hoc Network</b>	..... <i>ZHU Jing, ZHOU Xinli, SONG Binbin, et al(81)</i>
<b>Effect of Cross Section Shape of Tripod Legs on Firing Stability of Machine Gun</b>	..... <i>YANG Chengyuan, ZHOU Kedong, LIU Qiang, et al(87)</i>
<b>Experimental Study of Charge Damage in Multi-Layer Target Penetration Process</b>	..... <i>ZHANG Mengzhao, ZHOU Tao, GUO Hongfu, et al(92)</i>
<b>Unlocking Method of Aircraft Aerodynamic Control Surface Locking by Pin Puller</b>	..... <i>YAO Wang, ZHAO Xiaoning, ZHOU Guofeng, et al(98)</i>
<b>Performance Analysis of Mechanical-Electro-Hydraulic Regenerative Suspension System</b>	..... <i>ZHANG Weijie, WANG Guosheng, GUO Yong(103)</i>
<b>Damage Effect of Anti-Submarine Torpedo Warhead on Typical Submarine Targets</b>	..... <i>WANG Yu, LU Xi, ZHANG Fangfang, et al(112)</i>
<b>Research on Supercavitation and Hydrodynamic Characteristics of Torpedo Under Transverse Flow Disturbance</b>	..... <i>LI Haidong, QI Jianghui, WU Shuqing(117)</i>
<b>Study on Mechanical Response of Blast Resistant Transfer Window Under Blast Wave</b>	..... <i>XIANG Zhao, DAI Kaida, CHEN Pengwan, et al(123)</i>
<b>Research on Combat Effectiveness of Ten-Kilowatt Shipborne Laser Weapon Against UAV</b>	..... <i>XU Canran, SUN Shiyan, SHE Bo, et al(129)</i>
<b>Correcting Shooting Method for Moving Target</b>	..... <i>YAN Yanjun, PENG Zhizhao, YANG Haifeng(135)</i>

# JOURNAL OF ORDNANCE EQUIPMENT ENGINEERING

Vol. 42 No. 12 (Sum. No. 281) Dec. 2021

## Analysis of Pressure Distribution and Initiation Error of Liner with Double Curvature

..... LIU Jie, CHEN Xi, DU Zhonghua(141)

## Design and Implementation of Intelligent Adjustment Device for Action Mechanism of Crawler Equipment

..... LI Bing, TANG Hao, XIN Weiyuan, et al(147)

## SBFE Virtual Particle Boundary Method in Water Entry ..... LI Shangming, ZHAO Zibin(153)

## Size Effect on Mechanical Behavior of High Energy Propellant Under High Speed Impact

..... LIU Jihua, HE Changhui, ZHOU Jing, et al(159)

## Soft-Hard Segments Combined Double Layer Composite Structure Coating ε-HNIW

..... XIANG Junzhou, GUO Xueyong, WU Chengcheng, et al(164)

## Digital Rapid Modeling Method of Steel-Concrete Structure Target

..... WANG Liangquan, LIU Jianrong, SHANG Fei, et al(170)

## Influence of Multi Control Surfaces Deflecting in Same Direction on Static Aeroelastic Characteristics of Forward Swept Wing

..... ZHAO Xiwei, SU Xinbing, ZHANG Junyi, et al(176)

## Analysis of Ship Shaft Frequency Magnetic Field Propagation Characteristics Based on Horizontal Time-Harmonic Electric Dipole Model ..... PANG Xin, LIU Zhongle, Wen Wudi, et al(183)

## Study on Factors of Connecting Screws in Tail of Penetrating Projectile

..... WANG Heng, WANG Zhaoming, LIU Yuping, et al(188)

## Concept for Training System of Confrontation Between Real and Virtual Based on AR

..... SHAO Wei, XU Renjie, TAN Yaxin, et al(194)

## Optimization Technique of Helicopter System Periodic Maintenance Interval Based on Similarity Factor

..... SONG Haijing, JIAO Yi(198)

## Applicability of Contour map and Optimization of Measurement Matrix Screening in Compressed Sensing

..... WU Xiaolong, CHENG Tao, LI Degao, et al(203)

## Association Rule Mining of Metro Failures Based on Improved Apriori Algorithm ..... LIU Wenya, XU Yongneng(210)

## Research on Optimum Design of Permanent Magnet Synchronous Generator for Mobile Power Supply

..... ZENG Fanqi, BU Jianguo, YUAN Xiaojing, et al(216)

## Study on Extraction Algorithm for Pathological Spasm Based on Muscle Tension Perception

..... WANG Buyun, WU Chen, WEI Zhuangzhuang, et al(223)

## Calibration of Missile-Borne Magnetometer Based on Energy Evaluation

..... YAN Xiaolong, YU Tianpeng, FAN Xu, et al(233)

## Analysis of Formation Behavior of Autonomous Underwater Vehicles Under Weak Communication

..... LYU Da, SU Haoqin, GUO Mingyu, et al(239)

## Image Registration Method Basedon Optimized KAZE Algorithm ..... LI Peihua(248)

## Attitude Control of 3-DOF Helicopter System Based on Algorithm of GPI ..... WANG Lingling, WU Feilong(254)

## Study on Influence of Binder Type and Content of HMX-Based PBX on Response Behavior Under Cook-Off Conditions

..... QIAO Bingxu, LI Xiaodong, YAN Xiang, et al(261)

## Research on Target Echo Characteristics of Laser Fuze Detection ..... CHEN Song, ZHANG Xiaoqian, FAN Qiuya(268)

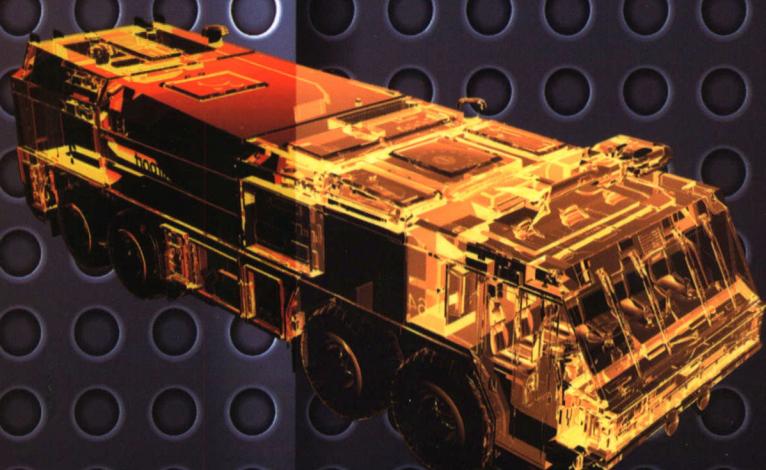
中文核心期刊  
CSCD核心期刊  
中国科技核心期刊  
RCCSE中国核心学术期刊  
美国化学文摘收录期刊  
美国乌利希期刊指南收录期刊  
中国军工专业文献数据库收录期刊  
中国学术期刊评价数据库来源刊  
CNKI中国期刊全文数据库来源刊  
中国科技论文在线数据库来源刊  
中国学术期刊文摘数据库（CSAD）收录

# 兵器装备工程学报

**Journal of Ordnance Equipment Engineering**

主管单位  
中国兵器装备集团有限公司

主办单位  
重庆市兵工学会  
重庆理工大学



兵器装备工程学报 **ISSN 2096-2304**  
**CN 50-1213/TJ** 定价：40元（人民币）