

中国学术期刊网络出版总库全文收录  
中国核心期刊(遴选)数据库全文收录  
中文科技期刊数据库全文收录

ISSN 2096-4641  
CN 31-2147/E

# 空天防御

AIR & SPACE DEFENSE

高速高机动导弹气动技术专刊

2022 第3期  
第5卷 总第19期

本期特稿:

中国空气动力研究与发展中心 赵忠良 等  
《导弹模型直气复合气动特性研究》

上海机电工程研究所  
上海交通大学出版社有限公司

主办

空  
天  
防  
御

三  
二  
三  
年

第  
五  
卷

第  
三  
期

总  
第  
十  
九  
期



# 空天防御

KONGTIAN FANGYU

2022年9月出版

本期执行主编:傅建明

2018年创刊·季刊

第5卷第3期

(总第19期)

## 目次

### · 专家特稿 ·

导弹模型直气复合气动特性研究 ..... 赵忠良,李浩,赖江,杨海泳,王晓冰,李玉平(1)

### · 亚跨大攻角和侧向力控制技术 ·

细长旋成体大攻角非对称涡模拟的扰动引入方式研究 ..... 张绍广,肖茂超,张宇飞,陈海昕(10)

空空导弹过失速重新定向技术研究 ..... 高昌昊,宋文萍,韩少强,路宽,王跃,叶坤(17)

细长体亚跨声速超大攻角复杂气动特性研究 ..... 王方剑,宋玉辉,刘金,秦汉,陈兰(27)

亚跨声速大攻角条件下细长体外形侧向喷流气动干扰研究  
..... 梁伟,张鑫,赵文龙,李欣,段旭(38)

细长体高速风洞超大攻角支撑干扰数值分析 ..... 秦汉,伍彬,宋玉辉,刘金,陈兰(44)

鸭式布局旋转导弹舵翼干扰问题气动特性研究 ..... 彭中良,陆韵,周志超,黄臻,刘泰涑(52)

### · 高效高精度算法及试验验证技术 ·

$\Phi 120$ 高超声速风洞流场校测 ..... 荣臻,胡文杰,邱云龙,张玉剑,王亦庄,江中正,陈伟芳(58)

高效高精度全局优化算法及其气动应用研究 ..... 徐圣冠,陈红全,张加乐,高缓钦,贾雪松(65)

一种融合物理规律的经验工程修正算法研究 ..... 邓晨,孔轶男,汪清,陈功(73)

### · 高速力/热和分离技术 ·

高速飞行器后向分离特性研究 ..... 薛飞,王誉超,伍彬(80)

高马赫数钝头体气动/传热一体化计算方法研究 ..... 吴王浩,段旭,张鑫,陈丹,徐振东(87)

当地DFD方法向LES湍流模拟推广的研究 ..... 徐振东,段宇轩,徐华松,杨帆,李铁(93)

# AIR & SPACE DEFENSE

Sept. 2022 (Quarterly)

Vol. 5 No. 3 (Series 19)

## CONTENTS

### • Special Paper of Expert •

Aerodynamic Characteristics of a Missile Model with Direct Force and Aerodynamic Force Compound Control Technology .....ZHAO Zhongliang, LI Hao, LAI Jiang, YANG Haiyong, WANG Xiaobing, LI Yuping (1)

### • Subsonic/Transonic Big Attack Angle and Lateral Force Control Technologies •

Study on Perturbation Introduction Method of Asymmetric Vortex Simulation of Slender Body at High Angle of Attack .....ZHANG Shaoguang, XIAO Maochao, ZHANG Yufei, CHEN Haixin (10)

Research on Poststall Re-orientation Technology of Air-to-Air Missile .....GAO Changhao, SONG Wenping, HAN Shaoqiang, LU Kuan, WANG Yue, YE Kun (17)

Aerodynamics Characteristics of Slender Body at Extra-wide Range of Angle of Attack in Subsonic and Transonic Speed .....WANG Fangjian, SONG Yuhui, LIU Jin, QIN Han, CHEN Lan (27)

Research on the Interference of Side Jet Plume to a Slenderbody in a Subsonic or Transonic Freestream Condition at Large Angle of Attack .....LIANG Wei, ZHANG Xin, ZHAO Wenlong, LI Xin, DUAN Xu (38)

Numerical Analysis of Support Interference for a Slender Configuration at Super Large Angles of Attack in High Speed Wind Tunnel .....QIN Han, WU Bin, SONG Yuhui, LIU Jin, CHEN Lan (44)

Aerodynamic Research on the Problem of Canard-Wing Interference of Rolling Airframe Missile .....PENG Zhongliang, LU Yun, ZHOU Zhichao, HUANG Zhen, LIU Tailai (52)

### • High Efficient & Accurate Algorithm and Test Verification Technologies •

Φ120 Hypersonic Wind Tunnel Flow Field Calibration .....RONG Zhen, HU Wenjie, QIU Yunlong, ZHANG Yujian, WANG Yizhuang, JIANG Zhongzheng, CHEN Weifang (58)

Study of the Efficient Global Optimization with High Accuracy and Its Applications in Aerodynamic .....XU Shengguan, CHEN Hongquan, ZHANG Jiale, GAO Huanqin, JIA Xuesong (65)

Research on Empirical Engineering Correction Algorithm Integrating Physical Laws .....DENG Chen, KONG Yinan, WANG Qing, CHEN Gong (73)

### • High Speed Force/Heat and Separation Technologies •

Study on Backward Separation Characteristics of High-Speed Air Vehicle .....XUE Fei, WANG Yuchao, WU Bin (80)

Research on the Integrated Calculation Method of Aerodynamics and Heat Transfer for Hypersonic Blunt Body .....WU Wanghao, DUAN Xu, ZHANG Xin, CHEN Dan, XU Zhendong (87)

Extension of the Local Domain-Free Discretization Method to Large Eddy Simulation of Turbulent Flows .....XU Zhendong, DUAN Yuxuan, XU Huasong, YANG Fan, LI tie (93)