



JPT

# 推进技术

Journal of Propulsion Technology

2

2018 Vol.39 No.2

第39卷 第2期

ISSN 1001-4055 CN11-1813/V



《推进技术》  
官方微信平台

中国航天科工集团三十一研究所

## 目次

### 总体与系统

- 拉力式对转桨扇发动机的建模与性能评估 ..... 王逸维,黄向华 (241)

### 气动热力学

- 非结构网格催化壁面的隐式处理方法 ..... 原志超,黄世璋,高效伟 (251)  
圆形截面超声速流道三维消波过程中的压力传播与几何变形 ..... 蓝庆生,赵玉新,赵一龙,刘红阳 (261)  
变几何低压涡轮气动性能研究 ..... 吴中野,方祥军 (269)  
密切弯曲激波乘波体技术的应用及有效性分析 ..... 卫 锋,贺旭照,秦 思,周 正 (277)  
Analysis of Component Matching Phenomena in a Double Bypass Compression System(英文) .....  
..... 刘宝杰,贾少锋,于贤君 (286)  
压气机叶片钝头前缘对边界层气动影响 ..... 李 乐,刘火星,李 鹏 (299)

### 燃烧 传热

- 径向冷却通道长度对气冷稳定器气动热力性能的影响 .....  
..... 罗一夫,刘友宏,李江宁,徐兴平,张志学 (308)  
固体火箭发动机零维两相燃烧室压强计算方法研究 ..... 刘平安,王 良,王 璐 (317)  
侧向喷流对超声速流动中支杆减阻降热特性影响的研究 ..... 朱 亮,陈 雄,周长省,李映坤 (326)  
高阻塞比肋化通道对流换热特性实验研究 ..... 周明轩,薛树林,贺宜红,李 维,杨卫华 (335)  
高压涡轮气冷叶片冷却掺混损失数值研究 ..... 侯伟涛,潘贤德,张 洪,慕粉娟 (342)  
RBCC发动机燃料支板热防护研究 ..... 鄢德堃,何国强,秦 飞,李文强,张 铎 (351)  
火焰增厚燃烧模型计算旋转预混火焰的参数敏感性分析 ..... 王 平,侯天增,余 倩 (358)  
基于数值定容弹方法的燃烧室声学特性研究 ..... 覃建秀,张会强,王 兵 (366)  
膏体燃气发生器启动特性研究 ..... 刘成浩,封 锋,曹钦柳 (374)  
再生冷却推力室热障涂层系统的热结构分析 ..... 邢昱阳,孙 冰,宋佳文 (380)

### 结构 强度 可靠性

- 边界滑移对波箔型动压气体轴承静特性的影响 ..... 张镜洋,赵晓荣,常海萍,方 华 (388)  
基于不可逆热力学的宏细观粘弹性损伤本构模型 ..... 顾志旭,郑 坚,彭 威,支建庄 (396)  
缠绕复合材料壳体低速冲击后剩余强度影响因素分析 .....  
..... 刘万雷,常新龙,张晓军,胡 宽,张有宏 (404)  
超声速混合层凹腔隔板的自激振动特性实验研究 ..... 李 浩,谭建国,侯聚微 (411)  
考虑轴向力影响的三点接触球轴承刚度特性研究 .....  
..... 李 杰,田拥胜,张华良,高 庆,谭春青 (419)  
航空发动机组合式弹性片金属密封环结构密封特性研究 .....  
..... 艾延廷,来纯强,郝燕平,孙 丹,吴天元 (426)

基于应力应变场强法的轮盘疲劳可靠性分析方法 ..... 陈志英,谷 裕,周 平,王 朝 (433)

测试与控制

基于射影算子的变循环发动机鲁棒自适应控制器设计 ..... 李 嘉,李华聪,韩小宝,王淑红 (440)

抽吸排气式高焓风洞应用实验研究 ..... 蒲旭阳,刘伟雄,李向东,毛雄兵,卢传喜,丛京伟 (450)

材料 推进剂 燃料

当量比及航空煤油组分含量变化对喷嘴表面结焦积炭影响 ..... 韩伟东,周健阔,甘志文 (456)

二维编织 SiC/SiC 陶瓷基复合材料宏观弹性常数预测及模态试验研究 .....  
..... 胡殿印,曾雨琪,张 龙,梅文斌,申秀丽,王荣桥 (465)

电推进和其它推进

20A 发射电流空心阴极小孔区等离子体特性研究 ..... 孙明明,宋嘉尧,张天平,杨 威,龙建飞 (473)

# JOURNAL OF PROPULSION TECHNOLOGY

Vol. 39 No. 2 Sum No. 248

Feb. 2018 (Monthly)

## CONTENTS

### System

Modeling and Assessment of a Contra-Rotating Puller Propfan Engine ..... WANG Yi-wei, HUANG Xiang-hua (241)

### Aero-thermodynamics

An Implicit Scheme with Unstructured Grid for Catalytic Surface ..... YUAN Zhi-chao, HUANG Shi-zhang, GAO Xiao-wei (251)

Pressure Transmission and Geometric Deformation for Supersonic Circle Section Flow in Process of Three-Dimensional Wave Cancelling ..... LAN Qing-sheng, ZHAO Yu-xin, ZHAO Yi-long, LIU Hong-yang (261)

Research on Variable Geometry Low Pressure Turbine Aerodynamic Performance ..... WU Zhong-ye, FANG Xiang-jun (269)

Application and Effectiveness Analysis of Wave-Rider Designed by Osculating Curve Shock (OCS) Flow-Field Method ..... WEI Feng, HE Xu-zhao, QIN Si, ZHOU Zheng (277)

Analysis of Component Matching Phenomena in a Double Bypass Compression System ..... LIU Bao-jie, JIA Shao-feng, YU Xian-jun (286)

Aerodynamic Influence of Compressor Blade with Blunt Leading Edge on Boundary Layer Performance ..... LI Le, LIU Huo-xing, LI Peng (299)

### Combustion and Heat Transfer

Effects of Radial Cooling Channel Length on Aero-Thermodynamic Performance of Air Cooled Flameholder ..... LUO Yi-fu, LIU You-hong, LI Jiang-ning, XU Xing-ping, ZHANG Zhi-xue (308)

Research of Two Phase 0-D Chamber Pressure Prediction Method for Solid Rocket Motor ..... LIU Ping-an, WANG Liang, WANG Lu (317)

Research on Effects of Lateral Jet on Drag and Heat Reduction Characteristics of Spike in Supersonic Flows ..... ZHU Liang, CHEN Xiong, ZHOU Chang-sheng, LI Ying-kun (326)

Experimental Investigation on Convective Heat Transfer Characteristics of High Blockage Ribs Channel ..... ZHOU Ming-xuan, XUE Shu-lin, HE Yi-hong, LI Wei, YANG Wei-hua (335)

Numerical Investigation into Coolant Mixing Loss of High Pressure Turbine Air-Cooled Blade ..... HOU Wei-tao, PAN Xian-de, ZHANG Hong, MU Fen-juan (342)

Research on Thermal Protection of Pylon in RBCC ..... YAN De-kun, HE Guo-qiang, QIN Fei, LI Wen-qiang, ZHANG Duo (351)

Large Eddy Simulation of Premixed Swirling Flames with Thickened-Flame Model: a Sensitivity Study ..... WANG Ping, HOU Tian-zeng, YU Qian (358)

Investigation on Acoustic Characteristic of Thruster with Numerical Constant-Volume Bomb Method ..... QIN Jian-xiu, ZHANG Hui-qiang, WANG Bing (366)

Study on Starts of Pasty Propellant Gas Generator ..... LIU Cheng-hao, FENG Feng, CAO Qin-liu (374)

Thermomechanical Analysis of a Regeneratively-Cooled Thrust Chamber with Thermal Barrier Coatings ..... XING Yu-yang, SUN Bing, SONG Jia-wen (380)

### Structure, Strength and Reliability

Effects of Sliding Boundary on Static Characteristics of Aerodynamic Compliant Foil Bearing ..... ZHANG Jing-yang, ZHAO Xiao-rong, CHANG Hai-ping, FANG Hua (388)

A Marco-Micro Viscoelastic Damage Constitutive Model Based on Irreversible Thermodynamic ..... GU Zhi-xu, ZHENG Jian, PENG Wei, ZHI Jian-zhuang (396)

A Parameter Study of Residual Strength of Filament Wound Composite Shell after Low-Velocity Impact .....  
..... LIU Wan-lei, CHANG Xin-long, ZHANG Xiao-jun, HU Kuan, ZHANG You-hong (404)

Experimental Studies on Self-Excited Vibration Characteristics of Splitter Plate with a Cavity in Supersonic Mixing Layer .....  
..... LI Hao, TAN Jian-guo, HOU Ju-wei (411)

Research on Stiffness Behavior of Three Point Contact Ball Bearing in Consideration of Axial Load .....  
..... LI Jie, TIAN Yong-sheng, ZHANG Hua-liang, GAO Qing, TAN Chun-qing (419)

Study on Sealing Characteristics of Compositied Elastic Metal Sealing Rings Used in Aeroengine .....  
..... AI Yan-ting, LAI Chun-qiang, HAO Yan-ping, SUN Dan, WU Tian-yuan (426)

Fatigue Reliability Analysis of Disk Based on Stress-Strain Field Intensity Method .....  
..... CHEN Zhi-ying, GU Yu, ZHOU Ping, WANG Chao (433)

**Test and Control**

Robust Adaptive Controller Design of Variable Cycle Engine Based on Projection .....  
..... LI Jia, LI Hua-cong, HAN Xiao-bao, WANG Shu-hong (440)

Applied Experimental Study of Exhaust High Enthalpy Tunnel with Pumping.....  
..... PU Xu-yang, LIU Wei-xiong, LI Xiang-dong, MAO Xiong-bing, LU Chuan-xi, CONG Jing-wei (450)

**Material, Propellant and Fuel**

Impact of Equivalence Ratio and Aviation Kerosene Components on Nozzle Coking Deposition .....  
..... HAN Wei-dong, ZHOU Jian-kuo, GAN Zhi-wen (456)

Effective Elastic Constants Prediction and Modal Test of 2D Braided SiC/SiC Ceramic Matrix Composites.....  
..... HU Dian-yin, ZENG Yu-qi, ZHANG Long, MEI Wen-bin, SHEN Xiu-li, WANG Rong-qiao (465)

**Electric Propulsion and Other Advanced Propulsion**

Plasma Characteristics in Orifice Region of 20A Discharge Current Hollow Cathode .....  
..... SUN Ming-ming, SONG Jia-yao, ZHANG Tian-ping, YANG Wei, LONG Jian-fei (473)