

# **CSAA/IET International Conference on Aircraft Utility Systems (AUS 2022)**

IET Conference Publications 805

Nanching, China  
17-20 August 2022

Volume 1 of 2

ISBN: 978-1-7138-6501-8

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2022) by the Institution of Engineering and Technology  
All rights reserved.

Printed with permission by Curran Associates, Inc. (2023)

For permission requests, please contact the Institution of Engineering and Technology  
at the address below.

Institution of Engineering and Technology  
P. O. Box 96  
Stevenage, Hertfordshire  
U.K. SG1 2SD

Phone: 01-441-438-767-328-328  
Fax: 01-441-438-767-328-375

[www.theiet.org](http://www.theiet.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## VOLUME 1

Experimental Study on Press Riveting for Joint Bearings with Mounting Groove .....	1
<i>Y. Wei, S. Liu, G. Niu, J. Wang, B. Hu, W. Li</i>	
Research on FLAP Rudder Servo Mechanism of the Aircraft .....	5
<i>C. Liu, Y. Li, Y. Jiang, H. Zhao</i>	
Review of Research Progress and Application of Magnetic Resonant WPT Technology .....	10
<i>W. Chen</i>	
Trade-Off Research of Cooling Architecture Proposal for Galley Carts of Civil Aircraft.....	18
<i>Y. Peng</i>	
Design of Cabin Lighting System Based on LED Wireless Control Technology in Civil Aircraft .....	23
<i>Y. Zeng, X. Li</i>	
Servo Control Method of Series Flexible Multi-Body Dynamics System.....	27
<i>H. Pang, W. Zheng</i>	
Optimization Method for Candidate Certification Maintenance Requirement on Civil Aircraft.....	33
<i>W. Tao</i>	
Numerical Analysis on the Influence of Valve Open on the Cavitation Flow Characteristics in Hydraulic Spool Valve.....	39
<i>Z. Zheng, M. Zhang, M. Qian</i>	
Research on Aircraft Servo System Modeling Method in Hardware in the Loop Simulation .....	44
<i>T. Jiang, F. Luo, H. Tian</i>	
Study on Application of Large Civil Aircraft Passenger Door Actuation System Based on Super Capacitor .....	49
<i>W. Zhi, A. Chen, W. Zheng, D. Liu</i>	
Door Opening Actuation System and Dynamics Simulation of Civil Aircraft .....	54
<i>W. Zheng, H. Pang, W. Zhi, D. Liu</i>	
Transmission Error Test and Analysis of Planetary Reducer with Small Tooth Difference and Variable Tooth Thickness .....	59
<i>J. Zheng, B. Li, D. Fan, X. Xie</i>	
Erosion Wear and Area Calculation of Orifice of Hydraulic Spool Valve.....	65
<i>C. Wang, X. Liu, S. Li, Y. Yin</i>	
Diode Health Assessment of Aviation Transformer Rectifier Unit Based on Mahalanobis Distance.....	71
<i>L. Zhang, Y. Xiang, Z. Li, W. Li</i>	
Flight Control Actuation System Modeling and Engineering Application .....	76
<i>H. Zhu</i>	

Weight Estimation Method of Core Components for More-Electric Aircraft Based on Component Model .....	82
<i>W. Zhu, W. Li, Y. Wu, F. Ai, X. Liang</i>	
General Scheme Study for Civil Aircraft Hydraulic Power System.....	88
<i>T. Li, H. Wang, Q. Zhao, B. Duan, T. Wu</i>	
The Verification of Civil Aircraft Airworthiness Compliance for Cockpit and Cabin in Low-Temperature Environment .....	93
<i>H. Tang, S. Luan</i>	
Mod-Simulation Analysis on Collaborative Performance of a Downscaling Test-rig for Main Landing Gear Steer Control System.....	98
<i>T. Li, H. Wang, Y. Shao, Q. Zhao, X. Xu, B. Duan</i>	
Research on Power Buffer Converter for Aircraft Electrical Propulsion Power System.....	102
<i>T. Lei, Q. Gao, S. Deng, X. Zhang, X. Zhang</i>	
Fault Analyses of Certain Aircraft Main Landing Gear Alternate Extension .....	108
<i>L. Tan</i>	
Analysis of Anti-Skid Braking Efficiency Calculation Method .....	113
<i>S. Wang, Z. Yan, K. Zhong</i>	
Analysis for Factors that Affect the Braking Efficiency Calculation .....	119
<i>S. Wang, K. Zhong, Z. Yan</i>	
Research on Stability Characteristics of Three-Wheel Refrigeration System .....	125
<i>Y. Zhou</i>	
Integrated Control Technology of Large Aircraft Ground Direction Correction Based on Monte Carlo .....	130
<i>J. Wu, Y. Zhao</i>	
Research on the Layout Plan of Inerting Gas Filling Inlet and Outlet of a Complex Fuel Tank.....	136
<i>C. Wang, Y. Wang, C. Li</i>	
Prediction of Evaporator Outlet Temperature of Icing Wind Tunnel Using Deep Neural Network .....	142
<i>X. Zhang, B. Peng, X. Yi, J. Qu</i>	
Design of Multi-Level Fault-tolerant Interactive Control Drive System for Aviation Electric Mechanism .....	147
<i>P. Mou, Y. Ji, J. Bao, Z. Xu, Z. Yue</i>	
Parameter Identification and Simulation Method of 2-Node Thermal Network Model of Aircraft Cabin .....	151
<i>Z. Liu, S. Dong, Y. Zhou, S. Zhang, Y. Fu</i>	
Application Research of Airborne Chemical Oxygen Generator.....	157
<i>D. Jiang, Y. Liu, H. Li, X. Fang, B. Qian</i>	
Design and Analysis of Air Pressure Reducer for Aviation .....	162
<i>D. Jiang, X. Fang, H. Li, B. Qian, H. Yang</i>	
Simulation Study of Fuel Tank Inerting System.....	168
<i>Y. Wang, C. Wang</i>	

Research on Vibration Reduction Characteristics of Electric Pump in Civil Aircraft Hydraulic System .....	174
<i>T. Wu, T. Li, B. Duan</i>	
A Test Method for Traction Load of Aircraft Nose Landing Gear.....	178
<i>X. Cui, Y. Li</i>	
High-Precision Frequency Acquisition Method and Device Based on FPGA.....	183
<i>S. Sun, W. Yan, Q. Zhang, P. Qu</i>	
Design of Grating Data Acquisition System for Airborne Displacement and Angle Measurement .....	187
<i>P. Qu, W. Yan, S. Sun, T. Zhu</i>	
Design and Application of Rapid Prototyping Environment for IMA System of Civil Large Passenger Aircraft.....	192
<i>J. Zhao, C. Wang, Q. Zhang, X. Ren, L. Yan</i>	
High Integration Design and Implementation of a New Type of Laser Semi-Active Guiding Device.....	197
<i>J. Zhao, B. Zhang, T. Ai, Q. Zhang, J. Wang</i>	
Fault Diagnosis of Aircraft Brake System Using Gaussian Bayesian Accelerated by FPGA.....	202
<i>L. Geng, R. Li, J. Sun, Y. Sun, J. Tian, P. Zhang, J. Zhang</i>	
Influence of Heat Source Parameters on Airborne Evaporative Cycle System Performance .....	208
<i>R. Wang, H. Zhan, J. Ouyang, Z. Gao, H. Yang, W. Hu</i>	
Aircraft Integrated Thermal Management Technology Based on Precise Control of Stepping Motor Servo Valve.....	214
<i>M. Hu, P. Qu, J. Che, W. Yan</i>	
A Design of Wall-Climbing Robot Used to Clean the Airplane Fuselage and Wings .....	220
<i>S. Wang</i>	
Optimization and Improvement of Aircraft Hydraulic Tank Pressurization System .....	225
<i>J. Qin, H. Jiang, J. Wang</i>	
Nonlinear Control of Satellite Tracking Turntable Based on Disturbance Compensation .....	232
<i>X. Liu, X. Chen, X. Liu</i>	
An Improved Adaptive Variable Pressure Control Strategy for Fuel Feeding System .....	237
<i>B. Yuan, C. Chen, L. Xue</i>	
Standardized Aircraft Electrical Power Quality Analysis and Realization in Accordance .....	243
<i>C. Li, Q. Ma, P. Xu</i>	
Research on High Precision Measurement of Head Position and Posture.....	250
<i>G. Luo, X. Liu, H. Gao, Z. Jin, W. Xie, W. Cui</i>	
Fuzzy Comprehensive Evaluation Analysis of Airborne Optical-Electronic Turret System .....	255
<i>X. Zhao</i>	
Application of Compatibility Test and Data Reconstruction in QTG Test of Civil Aircraft Engineering Simulator.....	261
<i>S. Pang, S. Li, Y. Xu, H. Wang</i>	
Research on the Stability of Aircraft with Nose Wheel Autonomous Taxiing Configuration .....	267
<i>H. Huang, H. Zhang, X. Liu, Y. Shang</i>	

Small Signal Impedance Based Stability Analysis of HVDC Aircraft Power System.....	273
<i>X. Lin, J. Xu, J. Zheng</i>	
Rapid Reconstruction Modelling Method of Civil Aircraft Power System Based on Power Flow Topology.....	279
<i>M. Cai, H. Wang, J. Xie, H. Zhang</i>	
Research on Multi-Physical Domain Modelling and Simulation Technology of Electromechanical System Based on Bond Graph.....	284
<i>D. Shan, Z. Zhao, J. Quan, Q. Yu, Y. Lan</i>	
Research on On-Line Detection and Location Device for Aviation Cable Faults .....	290
<i>H. Zhao, F. Yang, Y. Zou, D. Chen, X. Shi</i>	
DME Test Equipment Receiving Function Metrological Method and Device Design.....	295
<i>H. Zhao, G. Liu, D. Liu, D. Cheng, X. Shi</i>	
Simulation of Aviation DC Arc Heat Transfer Based on MHD Model.....	300
<i>H. Zhao, Y. Chen, M. Tian, D. Chen, X. Shi</i>	
Advance Brake Component Design Method by Topology Optimization with Additive Manufacturing for Weight Reduction.....	305
<i>B. Li, L. Chang, B. Wang, X. Zhu</i>	
Extended State Observer Based Robust Control of Electrical Cylinder Heavy-Load Start.....	310
<i>X. Zhang, Z. Wang, T. Wang, G. Wang, J. Huang, T. Yang, B. Sun</i>	
Research on the Integrated Magnetic Field Modulation Motor.....	316
<i>B. Sun, Z. Wang, Z. Song, G. Wang, J. Huang, Z. Zhang, X. Zhang</i>	
Research on Optimization Design of Gear Flowmeter Base on Fluent .....	322
<i>Y. Liu, Y. Ge, W. Ji, Y. Jiang</i>	
Maneuvering Characteristics and Influence of Aircraft Anti-Skid Braking System.....	328
<i>Z. Liu, Z. Zhu, C. Qin, Z. Wang, X. Dang</i>	
Research on Physiological Oxygen Demand Determination Method of Civil Aircraft Passenger Oxygen System Based on Blood Oxygen Saturation .....	332
<i>K. Cai</i>	
Analysis of Emergency Landing Load of Civil Aircraft with Single Main Landing Gear Extended Landing.....	336
<i>Y. Wang</i>	
Fault Analysis and Prevention on the Fracture of the Generator Elastic Shaft.....	340
<i>W. Cai, H. Wan, K. Zhuang</i>	
A Novel Rudder Surface Deflection Measurement Algorithm Based on Inclination Sensor .....	346
<i>L. Xie, S. Liu, L. Yang, Z. Yang</i>	
Research on Reconfiguration Design of Flight Controller Based on Control Allocation Under Actuator Failure.....	351
<i>Q. Qu, H. Wang, T. Li, F. Gu</i>	
Fault Analysis and Improvement of Air Pressure Pipe Fracture.....	356
<i>B. Yang, C. Chen, T. Zou, Y-Y. Wang</i>	

Virtual Instrument System Design Based on PCI Card and LabWindows/CVI .....	361
<i>Y. Liu, P. Su, K. Chen</i>	
Modelling and Simulation of the Jittering Problem When Transferring Dual Redundancy Data to Display .....	367
<i>M. Cui, X. Yang, Z. Zhao, C. Wu, Y. Lu, Y. Lan</i>	
Digital Modeling and Dynamic Analysis of RAT Systems.....	373
<i>W. Deqi, X. Lei</i>	
Study on Short-Circuit Current Suppression Methods of Dual-winding Permanent Magnet Fault-tolerant Machine for More Electric Aircraft Applications .....	378
<i>Y. Hu, S. Zhu</i>	
Research on Fault Simulation of Atmospheric Data Measurement System Based on AMESim.....	384
<i>Y. Yanting, F. Rui, J. Jinpeng, L. Jianyong, S. Jinghua, Y. Jin, Y. Zongpeng</i>	
Simulation of Fuel Tank Water Accumulation Under Flight Envelope .....	389
<i>W. Yang, L. Shao, J. He, Y. Peng</i>	
A Simulation Model for Supplemental Cooling System for Civil Aircraft.....	393
<i>Z.-Y. Lyu</i>	
Comprehensive Assessment of Aircraft Cabin Fire Hazard Based on Entropy Weight-Cloud Method .....	399
<i>J. He, L. Shao, W. Yang, B. Chen</i>	
Experimental Study on Performance of Spacecraft Heat Pump System Based on Manned Lunar Landing.....	405
<i>Z. Niu, Z. Fu, J. Miao</i>	
Study on the Shape of Cogging Structure of Rotor and Stator with Speed Sensor .....	411
<i>H. Wang, H. Jiang, T. Lei, Y. Wang, Z. Fan, J. Chen</i>	
Field-Circuit Coupling Simulation of Main Cargo Hatch Door Actuation System of Civil Aviation Cargo Plane .....	416
<i>H. Wang, X. Tian, Z. Wu, H. Qiao</i>	
Research on Signal Acquisition and Remote Transmission Based on Optical Fiber Communication .....	424
<i>B. Li, G. Hu, Y. Gao, G. Yang, G. Zhao</i>	
Comparative Analysis of Ram Air Turbine System for Large Civil Aircraft.....	429
<i>X. Zhao, L. Wang, M. Zhou</i>	
MBSE Modeling Method of Civil Aircraft Wheel Brake .....	435
<i>X. Ma, G. Chen, J. Zhang, T. Zhang</i>	
Construction and Application of a Digital Twin-Based Aircraft Landing Gear Management Environment .....	440
<i>J. Zhao, K. Chang, S. Li, Y. Xie</i>	
Research on Electromechanical Actuated Unlocking Technology of Landing Gear an Aircraft.....	444
<i>L. Zehua, L. Xin, Z. Jia, Y. Yin, Z. Jun</i>	
Research on Main Gear Steering Technology Based on Principle of Hole in Wall Feature .....	449
<i>L. Luo, J. Yang</i>	

Characteristic Analysis of Friction Force of Servo Valve Spool Under the Influence of Temperature.....	453
<i>S. Jiang, H. Lu, C. Heng, J. Li, Y. Zhang</i>	
Study on the Influence of Explosion Impact on Pilots in Ejection .....	460
<i>H. Guan, G. Li, Y. Chen, Y. Yang, Y. Zhu</i>	
Research on Energy Optimal Method of More Electrical Aircraft Base on Energy Storage .....	465
<i>Y. Liu, T. Huang, L. Xue, C. Tang, J. Wu</i>	
Failure Analysis and Improved Design on the Fuel Pipeline Under Random Vibration Loading Based on Frequency Domain Method .....	472
<i>W. Jiang, T. Hu, W. Li, M. Xiao</i>	
Civil Helicopter Crashworthiness Safety and CRFS Application.....	478
<i>H. Zhao, W. Lu, D. Wang, P. Ke, Z. Qu, Y. Hou</i>	
Research on Optimization Design of Airborne Hollow Fiber Membrane Core Size.....	482
<i>Y. Zhou, W. Jiang</i>	
Development of Wind Tunnel Dynamic Test System for Coupled Motion with Multi-Degrees of Freedom.....	488
<i>H. Tan, J. Wang, C. Bu, W. Mu, Y. Shen, H. Chen</i>	
Analysis of Lightning Protection Factors of Composite Aircraft Fuselage and Cable .....	496
<i>Z. Yang, Z. Ke</i>	
Research on Energy Management Strategy of Electromechanical Actuation System Base on Regenerative Energy Utilization.....	502
<i>T. Huang, Y. Liu, L. X. Xue</i>	
Research on Obstacle Avoidance Method of In-Situ Blades Grinding Robot Based on Improved RRT .....	508
<i>X. Shi, T. Shi, X. Lu</i>	
A New Method to Detect Phase Failure of the Motor Driving System .....	513
<i>J. Ni, C. Chen, D. Miao</i>	
Research on Performance Calibration Method of Civil Aircraft Pre-Cooler .....	519
<i>B. Chen</i>	
Dynamic Pressure Analysis of Civil Aircraft Hydraulic System Return Pipeline .....	523
<i>W. Si</i>	
Research on Thermal Management of Aircraft Fuel System.....	528
<i>C. Liu, M. Liu</i>	
The Design and Analysis of High Force Density Solenoid Electromagnet Working at Non Steady Thermal State .....	534
<i>W. Li, J. Huang, J. Wang, Z. Zhang</i>	
Analysis and Experimental Verification of Rapid Decompression in Civil Airplane .....	540
<i>C. Zhang, S. Lin, Y. Zhu, Y. Yang</i>	
High Real-Time Locomotion Recognition Algorithm Using Inertial Measurement Units .....	546
<i>J. Wang, X. Wang, Y. Miao, S. Wang, M. An, Y. Miao, A. I Gavrilov</i>	



Modeling and Simulation of Airborne Radar Antenna Tracking Device with Fuzzy Control .....	553
<i>S. Yongfang</i>	
Research on Optimal Design of Two-Stage Radial-inflow Turbine with Small Flow and Large Expansion Ratio .....	559
<i>Z. Yunfeng, H. Wenchao, S. Jun, L. Bo</i>	
Application of ICD Management Software in Aircraft Design and Test .....	563
<i>Y. Lan, Z. Zhao, J. Y. Wang, D. Shan, X. W. Yang, M. X. Cui</i>	
Contact Modelling for a Reciprocating Rod Seal with Non-Gaussian Rough Surface .....	569
<i>J. Wang, J. Li, C. Ma</i>	
Remote-Controlled Air Data Test System in Iron-Bird .....	575
<i>J. Shi, Y. Cao, L. Chen, Y. Yang</i>	
A Soft-Switching Capacitive Wireless Power Transfer System with Asymmetric Bilateral LCL Resonant Network .....	580
<i>Z. D. Li, Z. X. Guo, L. Q. Lan, W. L. Li</i>	
Research on Airworthiness Certification of Airborne Software in Civil Aircraft Compliance Verification Test .....	586
<i>L. Feng</i>	
Multi-Index Synthesized Based Health-degree Quantitative Evaluation Algorithm for Actuation System .....	592
<i>J. Wang, J. Huang, Z. Wang, X. Na, W. Li, L. Fan</i>	
Performance Analysis of High-Speed On-off Valve Coupled with Thermal Effect .....	599
<i>Y. Li, N. Wang, S. Deng, H. Du, H. Huang, K. Sheng</i>	
Simulation and Experimental Research on Adaptive Control Algorithm of Helicopter Fly-By-wire Actuator .....	607
<i>J. Zhang, S. Shao, J. Yao, C. Wang</i>	
Research on Aircraft Fuel Level Sensor Based on Fiber Grating .....	612
<i>Y. Yin, S. Dong, F. Kong, M. Yuan</i>	
A Novel Rotor Position Fault Diagnosis Strategy .....	620
<i>H. Zhang, X. Duan, Y. Yang, R. Zhang, K. Fan, K. Wang, X. Wang</i>	
A Test of Adaptive Notch Filter Based Interference Mitigation for BDS-3 B1C Signal Acquisition .....	628
<i>Y. Deng, Q. Zhou, G. Cheng, W. Li</i>	
Analysis and Research of Oil Friction Loss of Oil-Cooled Motor for Aero .....	634
<i>L. Meng, Y. Bo, Z. Yuru, T. Lei</i>	
Real-Time Hybrid Gait Phase Recognition Algorithm Under Continuous Multimodal Locomotion for Lower Limb Exoskeleton .....	638
<i>Y. Miao, X. Wang, J. Wang, S. Wang, A. I. Gavrilov</i>	
Research on Main Wheel Coordinative Turning Control System of Civil Widebody Aircraft .....	644
<i>X. Xu, Y. Shao, Q. Lu</i>	
Simulation and Analysis of Electro-Hydraulic Proportional Servo Valve Port Under Erosion Wear .....	650
<i>L. Bing, X. Liu, D. Li, P. Qi, Z. Jiao</i>	

Simulation Analysis on Flow Field of Profiled Pipelines Inside Aviation Hydraulic Integrated Block Based on COMSOL.....	656
<i>D. B. Li, X. C. Li, L. Bing, Z. Y. Qiu, P. Y. Qi, W. Z. Qiao</i>	
Research and Verification of Aircraft Visual Fuel Measurement Method .....	662
<i>H. Zhu, S. Gao, Y. Shao</i>	
Simulation Study on Fire Extinguishing System of Ultra-Fine Powder Extinguishing Agent in Helicopter Engine Compartment .....	668
<i>W. Ma, H. Jing, S. Wang, S. Lu</i>	
Research on Stability Mode of Lightweight Photoelectric Pod.....	676
<i>S. Fan, K. Xu, N. Chen</i>	
Load Analysis and Synchronous Antiskid Control of Multi-Wheel Aircraft.....	681
<i>X. B. Zhu, Y. X. Shang, X. C. Liu, N. Bai, Z. Z. Wang, P. Y. Qi</i>	
Methodology of Architecture Representation and Enumeration of More-Electric Flight Control System .....	687
<i>Z. Wang, Z. Jiao, Y. Li</i>	
Structural Performance Analysis of Piston Pump Valve Plate for Pump-Controlled Cylinder System .....	693
<i>C. Jia</i>	
Research on Debonding Between Rubber and Metal of Bladder Accumulator.....	699
<i>W. Qi, M. Wang</i>	
Design of Airborne Flight Lock Actuator Electronics .....	706
<i>J. Wang, L. Li, Z. Xue, G. Niu, H. Wu, Z. Nie</i>	
Research on Common-Mode Interference Current Suppression of Active Neutral Point Clamped Five-level Inverter .....	712
<i>W. Ye, H. Kang, G. Huo, X. Liu, Y. Liu</i>	
Study on Performance of Autonomous Power Generation and Refrigeration System of the Jamming Pod.....	719
<i>K. Luo, B. Lv</i>	

## VOLUME 2

Simulation Research of Low Fuel Penalty Half-Closed Loop Air Cycle Cooling System.....	725
<i>C. Yang, Z. Wang, Z. Sun, Z. Gao</i>	
Architecture Design of Virtual Integration Test Platform for Civil Aircraft Based on ED-247 Specification.....	730
<i>S. Li, L. Li, B. Xie, H. Wang</i>	
A New Servomechanism for Static Load Test .....	734
<i>X. Zhang, Y. Yin, S. Li, B. He</i>	
Design Optimization of Double-Sided PMLSM with Unequal Width Halbach Magnet Array .....	740
<i>Y. Li, L. Yan, P. Xiang, A. Aboelhassan, C. Gerada</i>	
Study on Impact Pressure and Ventilation Capability of Aircraft Pressure Refueling System .....	745
<i>M. Liu, Z. Wang, J. Ren</i>	

A Coordinated Assignment Method for multi-UAV Area Search Tasks .....	751
<i>F. Zhu, F. Wu, C. F. Chen, D. Li, Y. Guo, J. G. Zhang, X. Zhao</i>	
Composite Fault Detection Scheme Using Finite-Time Integral Sliding Mode Filter of Electro- mechanical Flight Actuators .....	757
<i>Z. Yang, Q. Mao, X. Li, X. Jin</i>	
Virtual Vibration Monitoring and Health Indicate for Ball Screw in Electromechanical Servo System: A Digital Twin Approach .....	763
<i>D. Liu, S. Wang, J. Shi, S. Qiao, G. Liu</i>	
Multidisciplinary Modeling Simulation Research Based on Distributed Co-Simulation Protocol.....	770
<i>Y. Cao, H. Wang, M. Cai</i>	
Development of Aircraft Brake System.....	775
<i>Y. An, X. Tong, S. Yang</i>	
Study on the Performance of a New Type of Microchannel Cold Plate for Shrinkage/expansion Parallel Flow Channel Design .....	780
<i>Y. Fu, H. Bai, S. Yang</i>	
Numerical Simulation of Rain Accumulation on Aircraft Windshield .....	787
<i>S. Lu, W. Chen, H. Shen, G. Zhu, R. Shi</i>	
Numerical Simulation of Supercooled Large Droplet Icing Based on Random Icing Model .....	794
<i>R. Shi, J. Zhao, W. Chen, H. Shen, Q. Cheng, S. Lu</i>	
Study on Redundancy Fault-Tolerant Control Strategy of Dual-winding Permanent Magnet Machine for More Electric Aircraft Applications .....	800
<i>Y. Ge, Y. Hu, C. Peng</i>	
Study on Electrothermal Anti-Icing System of Engine Inlet Flow Guide Vane with Different Heating Mode .....	806
<i>B. Ning, W. Wang, W. Chen, H. Shen, D. Zhang, N. Guan</i>	
Research on Electromagnetic Interference Control for Aircraft Eletromechanical System.....	813
<i>S. Yang, T. Yang, B. Yang, H. Sun, H. Hou, L. Ni</i>	
Research on the Recognition of Aircraft Fuel Pump Parts Based on Deep Learning.....	821
<i>Z. Cui, Q. Tian, Y. Yang, C. Yang</i>	
Design and Implementation of Malfunction Simulation System for Aircraft Hydraulic Test Bench .....	825
<i>J. Jing, X. Chen, L. Xia, C. Peng</i>	
Fuel Cooling Technology Based on Efficient Heat Dissipation .....	830
<i>Y. Tao</i>	
The Simulation Analysis of a Control Strategy for the Multi-Cabin Helicopter Vapor Compression Cycle System with the Amesim.....	837
<i>W. Deng</i>	
Construction and Application of a Joint Simulation Platform for Engine Bleed and Ground Simulation Test System .....	842
<i>J. Zhang, S. Luan, B. Zhao, Z. Dai, S. Dong</i>	
Design of a LVDT Signal Acquisition System Based on DSP 28335.....	848
<i>K. Yang, L. Xu, L. Yang, Y. Ge</i>	

Reliability Test and Evaluation of Hydrogen-Turbopump-powered Digital Control Servo System.....	853
<i>Y. Liu, Z. Wang, T. Lan, G. Jing, X. Zhang</i>	
Numerical Analysis on the Performance and Axial Force Characteristics of Low Specific Speed and High Head Aviation Fuel Pump.....	858
<i>Z. Han, Q. Tang, H. Fan, Y. Chen, Z. Cui</i>	
Modeling of Aircraft Fuel System and Simulation of Fuel Quality Characteristics Based on AMESim.....	866
<i>G. Chen, L. Gu, Y. Guo, M. Niu</i>	
Research on Pneumatic Servo Brake Technology Using Solenoid Valve.....	871
<i>R. Xing, X. Wang, B. Yang, D. Xiang, B. Chen, Y. Yang, L. Hu, B. Pang</i>	
Flight Control of a Long-Endurance Solar-powered UAV Based on Model Predictive Control.....	876
<i>Q. Li, P. Qi</i>	
Digital Twin Model of Permanent Magnet Synchronous Motor Based on Gradient Descent Algorithm.....	882
<i>D. Ren, S. Wang, J. Shi, X. Yang</i>	
Research on Intelligent Speech Recognition Algorithm in UAV Ground Station.....	889
<i>X. W. Wang, G. J. Lai</i>	
Fault-Tolerant Control of Aircraft Rudder Surfaces Based on Pseudo-inverse Planning and Sliding Mode Control.....	894
<i>W. Qian, L. Yang, Y. Xue</i>	
Research on Functional Safety Integrated Design Method of Servo Driver.....	900
<i>C. Lingyu, F. Dapeng, L. Baoyu</i>	
2F/1F Wavelength Modulation Spectroscopy Method for Airborne Tdlas Oxygen Sensor with Emd-Savitzky-golay Filtering.....	906
<i>C. Dong, X. Zhang, J. Liu, L. Chen, H. Zhao, X. Li, X. Lu, W. Kong, B. Liu, Y. Miao</i>	
Damping Linearization of Ankle Prosthesis Based on Electro-Hydrostatic Actuation.....	913
<i>D. Dong, X. Wang, X. Tian, S. Wang, Y. Wei, A. I. Gavrilov</i>	
Automatic Test Method for Semi Physical Test Based on Tset Cases.....	919
<i>C. Wang, H. Liu, Y. Liu, Y. Hu</i>	
Laboratory Verification Method for Warm-Up Or Cool-down Requirement of Civil Aircraft.....	924
<i>X. Liu, Z. Dai, Y. Cui, S. Liu, Z. Liu</i>	
Research on the Usage of Model Element Library in Airborne Software.....	928
<i>W. Zhang, J. Yang, Q. Sun</i>	
The Modeling and Analysis of Dynamic Characteristics of the Aircraft Wheels.....	933
<i>L. Chen, G. T. Xie</i>	
Improvement in Pi-Fuzzy Hybrid Control Algorithm of Three-Stage Motor Staring Control.....	938
<i>C. Qin, J. Wei</i>	
Study on Wear Characteristics of Friction Pair in High Pressure and High-Speed Axial Piston Pump.....	944
<i>J. Huang, Q. Zhang, W. Zhou, T. Wang</i>	

Systems Architecture Trade Study of More Electric Aircraft Based on Economic Evaluation .....	951
<i>G. Cao</i>	
Simplified Rotor Position Estimation Method for Aircraft Starter/generator Based on Harmonic Signal Self-Injection.....	956
<i>J. Wang, J. Wei, Y. Shen</i>	
Analysis of Influence of Bending Radius on Strength of Titanium Alloy Tube .....	962
<i>Y. Yuan, X. Wan, Y. Xu, S. Yang, X. Tong</i>	
A Highly Integrated Discrete Interface Circuit Based on HKA1223-CSC.....	967
<i>T. Zhu, P. Qu, Q. Zhang, W. Yan</i>	
Active Disturbance Rejection Control of Two Axis Servo Turntable.....	971
<i>S. Yongfang</i>	
Deep Learning Neural Networks for Rolling Bearing Fault Diagnostic Classification.....	976
<i>J. Shouhu, A. Yongwei, J. Guanwei, X. Weiqing, W. Jia, C. Maolin</i>	
A Generic Method for Sound Data Acquisition and Processing on Civil Aircraft Engineering Simulator .....	981
<i>S. Pang, H. Sun, Y. Xu, H. Wang</i>	
Active Control of Fluid Pulsation in Hydraulic Systems with Load Pressure of Wide Variation.....	985
<i>C. Li, Y. Xu, C. Wu, Z. Chen, J. Liao, Z. Jiao</i>	
Flow Ripple Reduction of Even-Piston Pump with Valve-controlled Communicating Passage in Port Plate .....	991
<i>R. Wang, Z. Jiao, Y. Ling, Y. Xu, J. Yang, C. Li</i>	
Stepless Variable Pressure Pump Based on Proportional Control Valves.....	998
<i>Y. Xie, J. Zhao, Y. Li, K. Chang, W. Li, Y. Xu</i>	
A New 65-Node Thermal Model Suitable for Low Temperature Environment and Based on Chinese Thermo-biological Features.....	1003
<i>T. Huiru, Y. Shuai, L. Xianbin</i>	
An On-Ground Centreline Tracking Algorithm for Aircraft with Multiple Actuators Based on Active Disturbance Rejection.....	1008
<i>N. Bai, X. Liu, Z. Wang, P. Qi, Z. Jiao, Y. Shang</i>	
Research on Current Carrying Capacity of Feeder in Variable Frequency Power Systems.....	1015
<i>C. Mengdi, W. Hongxin, X. Yuhao, H. Jiachen</i>	
Research on Position Disturbance Rejection Control of EHA-DD .....	1019
<i>J. Yao, J. Hao, A. Zhang, T. Sha, D. Wang</i>	
Preliminary Analysis for a Number of Aircraft Oxygen System Explosion Accidents .....	1027
<i>J. Dongsheng, Y. Haowen, L. Hui, L. Yue, F. Xingxing</i>	
Preliminary Study on Ozone Converter.....	1032
<i>J. Dongsheng, Q. Binbin, L. Hui, Y. Haowen, L. Yue</i>	
Simulation Research of Pump-Driven Two-phase Loop with Three Evaporators Based on Amesim .....	1037
<i>K. Liu, X. Yang, X. Li, P. Zhang</i>	

A Self-Adjusting Pulsation Attenuator for Hydraulic System of Variable Pressure .....	1044
<i>Q. Wang, Y. Xu, Z. Chen, R. Wang, J. Liao, Z. Jiao</i>	
The Research of a Plate Fin Cold Plate Characters Based on Numerical Simulation .....	1050
<i>P. He, P. Zhao, L. Hu, R. Wang</i>	
Design and Optimization of Landing Gear Lower Position Lock .....	1058
<i>G. Rao, S. Zhang, J. X. Liu, B. Gao, J. S. Liu</i>	
A Lightweight, Robust Real-Time Lidar Inertial Odometry Framework .....	1062
<i>Y. Sun, J. Hao, Y. Zhou, N. Li, S. Ma, Z. Zou</i>	
Research on Landing Gear Strut Damping Orifice Design Based on Nurbs for Optimizing Aircraft Ground Dynamics.....	1069
<i>S. Li, L. Li, H. Wang, D. Xie</i>	
Analysis and Verification of Error Factors in Optical Measurement of Ejection Seat Attitude.....	1074
<i>X. Liu, H. Gao, X. Qi</i>	
Research on the Method of Monitoring a Servo Valve Spool Position Model .....	1081
<i>X. Liu, X. Shen, F. Yang</i>	
Aerodynamic and Powertrain Design of a Novel VTOL Configuration.....	1087
<i>R. Zhao, Z. Jiao, L. Zhao</i>	
Fault Tolerant Control on Single Phase Open Circuit Fault for Dual-Three Phase PMSM.....	1095
<i>X. Wei, L. Yan, L. Zhang, Z. Jin, J. Wang, H. Su, X. Quan</i>	
Analysis and Simulation of Typical Faults of Electro-Hydraulic Proportional Servo Valve .....	1101
<i>R. Zhang, X. Wang, Y. Zhang, J. Li, J. Wang</i>	
Thermal Management Study of UAV Fuel-Environment Control System .....	1107
<i>Shuai Xu, Weijian Chen, Siqi Wang, Dalin Zhang, Penglei Zhang</i>	
Study on Stress Characteristics of High-Speed Aviation Fuel Pump Based on Fluid-Structure Coupling .....	1113
<i>Y. Chen, Q. Tian, S. Xu</i>	
Performance Analysis of Partial Closed-Loop Air Cycle System with a Power Turbine .....	1119
<i>Q. Lu, Y. Wu, Z. Gao, D. Zhang</i>	
Inductive Debris Detection Using Common-Mode Rejection.....	1125
<i>M. Zhao, W. Hong, B. Chen, H. Li, C. Lu</i>	
An Aircraft Landing Gear Walk Suppression Method Based on Runway Identification.....	1131
<i>Z. Wang, X. Liu, D. Liao, N. Bai, P. Qi, Z. Jiao</i>	
Lifetime Evaluation of Mechanical Gyroscope Based on Incomplete Data and Censored Data.....	1137
<i>C. Lv, J. Liu, Z. Yang, X. Zhang</i>	
Research on Torque Ripple Suppression Method of Switched Reluctance Motor Drive System.....	1141
<i>Yi Ren, Yuntao Su, Jianfei Wang, Chengxiang Jiao, Hongying Yu, Xiao Quan</i>	
Management System Development .....	1147
<i>W. Ju</i>	

Simulation of the Pneumatic Retraction/extension System for UAV Landing Gear .....	1152
<i>Z. Qu, W. Chen, J. Zhao, D. Zhang, G. Zhu</i>	
Numerical Simulation of UAVs Electronic Equipment Heat Dissipation Under a Low-Altitude Environment .....	1158
<i>G. Zhu, M. Wang, H. Gong, W. Chen</i>	
Motion Planning of Tbm Disc Cutter Changing Robot Based on Improved RRT-Connect Algorithm .....	1164
<i>J. Wu, Z. Tao, J. Tao</i>	
Simulation Study of Filling Conditions for Aircraft Fire Suppression Systems .....	1171
<i>C. Yuan, Y. Wang, H. Li, C. Dai, S. Lu, H. Zhang</i>	
Thermal Analysis of Key Components in EHA System Under High Temperature Condition .....	1178
<i>S. Fan, X. Wang, S. Wang, H. Xin, S. He, S. Li, S. Wu, X. Wu, Y. Niu</i>	
A Portable Prognostic Instrument for Power Distribution Unit Used in Aircraft .....	1184
<i>W. Ren, Y. Zhang, Z. Zhang, Y. Meng</i>	
Non-Circulating Liquid Cooling Structure for Short-time High-power Heat Generation Stage of Motor .....	1189
<i>Z. Lin, C. Zheng, H. Qian</i>	
Research on Low Power Thermal Management Technology of Stratospheric Airship Motor Controller .....	1195
<i>C. Yang, C. Zheng, H. Qian</i>	
Design and Analysis of High-Speed Drive Motor for EHA System.....	1203
<i>Z. Jin, X. Wei, L. Yan, J. Wang, H. Su</i>	
Nonlinear Characteristics Analysis and Simulation of Giant Magnetostrictive Actuator .....	1209
<i>Y. Niu, S. Wang, X. Wang, S. Li, S. He, X. Wu, S. Fan</i>	
Simulation of Linear Oscillating Motor Control Based on Model Predictive Control .....	1215
<i>Y. Cao, Y. Li, X. Li, L. Zhang, L. Yan, Z. Jiao</i>	
Particle Swarm Optimization-Based Synchronization Control of Dissimilar Redundant Actuation System .....	1221
<i>C. Shi, Q. Wang, S. Wang, X. Wang</i>	
Virtual Synthesis Method on the Localizer and Glideslope Guidance Signal for Instrument Landing System .....	1227
<i>W. Shen, Z. Jiao, P. Qi, X. Liu</i>	
Design of Charge Feedback High-Frequency Drive Circuit and Amplifier Mechanism for Piezoelectric Actuator.....	1233
<i>X. Wu, S. Wang, X. Wang, S. He, S. Li, Y. Niu, S. Fan</i>	
Stress Analysis of a Flat Linear Switched Reluctance Motor with Double Excitation Windings.....	1239
<i>L. Zhang, L. Yan, X. Wei, H. Su, Z. Dong, Li Li</i>	
Key Technologies and Development Tendency of Airborne Distributed Electro-Hydraulic Generation System .....	1245
<i>S. Nie, W. Chen, L. Xu</i>	
Study on Flight Profile Simulation of Fuel System Basing on Flowmaster .....	1251
<i>C. Liu, M. Liu</i>	

Research on Intelligent Independent Load Control Method of Digital Electro-Hydraulic Actuator of Rocket Nozzle .....	1258
<i>T. Zhao, S. Wu, W. Li, Y. Wang, C. Fang, J. Fu, J. Yang, C. Li</i>	
Research on Simulation Mechanism and Method of the Bolt Preload .....	1265
<i>J. Huang, Y. Liu, W. Zhou, H. Mei, B. Hu</i>	
Energy Optimization of Aircraft Thermal Management System .....	1270
<i>Y. Wang, Z. Li, G. Zhang, H. Zhang, Y. Zhao, X. Tong</i>	
Control Harmonic Optimization of High-Speed Generator Based on Particle Swarm Optimization.....	1277
<i>Q. Hu, Y. Ma</i>	
Research on Harmonics and Active Power Filter of Aircraft Power Grid .....	1282
<i>C. Guo, G. Bo, P. Zhe, L. Shuai, H. Chao</i>	
Investigation of the Blade Number and Splitter Blade's Effect to the Thermodynamic Performance of ACM Turbine .....	1288
<i>L. Bo, D. Boning, W. Yang, Z. Yunfeng, H. Wenchao</i>	
Theoretical Modeling and Analysis of Variable Reluctance Wheel Speed Transducer .....	1294
<i>Z. Chen, C. Zheng, H. Qian, J. Su</i>	
More Electrical Aircraft Pulsed Power Mitigation Through Active Capacitor Converter .....	1300
<i>F. Ai, J. Zhang, Y. Qi, W. Li, J. Deng</i>	
Thermodynamic Research on Tension Front Jack .....	1306
<i>X. Yang, Y. Bai, H. Song, J. Shao, J. Wang, W. Liu, X. Liu, S. Li</i>	
Research on Thermal Characteristics and Thermal Management of Airborne Fiber Laser .....	1312
<i>C. Cheng, Y. Li, Z. Jiao</i>	
Mixed Uncertainty Modelling and Analysis of Rotor Dynamics for Power and Thermal Management System .....	1319
<i>S. Wang, Y. Li, Y. Shang</i>	
Adaptive Combined Noise Reduction for Helicopter Tail Transmission System .....	1327
<i>H. Wang, J. Wang, D. Shen</i>	
Research on the Flow Characteristics of the Secondary Regulation Aircraft Weapon Bay Door Drive System with Accumulator.....	1333
<i>Z. Wang, X. Liu, Z. Qiu, Z. Jiao</i>	
Research on Energy Flow Characteristics Between Elector-Hydrostatic Actuator and Power Supply Network.....	1338
<i>L. Jiang, Y. Li, Y. Shang</i>	
Multi-Fault Mechanism Analysis and Diagnosis of Traction Motor in Urban Rail Transit.....	1346
<i>S. Qiao, S. Wang, J. Shi, D. Liu, X. Duan, X. Wu</i>	
Design and Discussion of On-Orbit Autonomous Health Management System for Mission-constrained Spacecraft.....	1353
<i>C. Chen, Y. Yin, Y. Liu, D. Wang, R. Chen, Y. Jia</i>	
Research on Fuzzy Control of Pressurized Conveying System.....	1361
<i>J. Wang, H. Wang, D. Shen</i>	



Numerical and Experimental Investigations on Cavitation Characteristics of Inducer and Impeller Combination Fuel Pumps .....	1368
<i>Q. Tian, C. Lin, R. Hu, C. Ya, S. Xu</i>	
Analysis and Modelling of Ground Dynamics Model for MOC8 .....	1376
<i>Y. Yuling, H. Ding, S. Lv, L. Li</i>	
Modelling and Control Allocation of a New VTOL Configuration.....	1382
<i>Y. Liu, Z. Jiao, L. Zhao</i>	
Development of Gust Generator for Wind Tunnel Driven by Hydraulic Swing Cylinder.....	1390
<i>J. Yu, C. Bu, S. Wu, S. Dong, S. Wu</i>	
Icing Tests for the Anti-Icing Structure with Exterior Hot Air Film Heating .....	1395
<i>P. Ke, C. Liu, C. Yang</i>	
Research of Safety Risk of Aviation Seat Restraint System During Emergency Landing.....	1401
<i>H. Guo, P. Ke, S. Liu, Y. Zhao, L. Zhang</i>	
Pilot Injury Risk Analysis for Typical Flight Modes Based on Numerical Simulation .....	1407
<i>Y. Li, P. Ke, C. Liu, S. Liu, Y. Zhao, L. Zhang</i>	
Research on Line of Sight Motion Modeling and Fire Control Correction of Ballistic Calculation System .....	1414
<i>C. Shen, S. Fan, Y. Chen, W. Zhu, L. Zhang, D. Fan</i>	
A Precise Cabin Grasping Method Based on Visual Guidance .....	1421
<i>Y. K. Chen, K. Xu, Z. J. Wen, S. X. Fan, L. Liu, G. A. Ren, K. Xu, D. P. Fan</i>	
Design of Digital Lock-In Amplifier Based on ZYNQ-7020 .....	1427
<i>S. X. Fan, Z. A. He, L. H. Xing, N. Chen, D. P. Fan</i>	
Design and Optimization of a Fast Steering Mirror Driven by Voice Coil Motor.....	1433
<i>S. X. Fan, D. Ouyang, N. Chen, Y. Yu, D. P. Fan</i>	
Fluid Field Simulation and Test Research on Safety Valve in Electro-Hydraulic Servo Mechanism.....	1439
<i>S. Yi, Z. Wang, Y. Qu, B. Li, J. Wang</i>	
Modeling of Electrical Interface of Electromechanical Management System Based on Saber .....	1444
<i>W. He, C. Ruang, L. Liang, W. Peng, W. Kunyu, Z. Wei, Z. Jintao, W. Jianwen</i>	
Thermal Runaway of Lithium Battery Based on Star CCM+.....	1451
<i>Z. Man, S. Wang</i>	

**Author Index**