

23rd International Conference of Fluid Power and Mechatronic Control Engineering (ICFPMCE 2022)

Held online due to COVID-19

Atlantis Highlights in Engineering Volume 10

Kunming, China
22 – 24 March 2022

Editors:

**Liang Yan
Jing Na**

ISBN: 978-1-7138-6706-7

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.

Print copyright© (2023) by Atlantis Press (part of Springer Nature)
All rights reserved.
Copyright for individual electronic papers remains with the authors.

For permission requests, please contact the publisher:

Atlantis Press
Van Godewijkstraat 30
3311GX Dordrecht
The Netherlands

contact@atlantis-press.com

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

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
Web: www.proceedings.com

TABLE OF CONTENTS

Numerical Investigation on Silt Particle Abrasion Characteristics of the Centrifugal Pump	1
<i>Xiangdong Han, Youchao Yang, Chao Wang, Pengjun Fan, Yaping Tian</i>	
Research on the Thermal Performance of a Helical Coil Heat Exchanger	11
<i>Zuti Zhang, Hanyang Liu</i>	
Analysis of Demagnetization Characteristics of X70 Steel Based on Permanent Magnet Demagnetization Method	27
<i>Fulin Song, Hong Zhao</i>	
Peer-Review Statements	38
<i>Liang Yan, Jing Na</i>	
Reliability Analysis of Synchronous Steering Control for Multi-Vehicle Formation	40
<i>Jianjun Wang, Jingyi Zhao, Rui Guo, Wenlei Li</i>	
Numerical Investigation of Effects of Silt Particles with Different Mean Diameters on Cavitation Flow Evolution in the Nozzle	50
<i>Xiangdong Han, Fangyan Yu</i>	
Analysis of Mechanical Properties of Iron Roughneck's Spin-Rollers	61
<i>Yongbai Sha, Quan Li, Xiaoying Zhao</i>	
Intelligent Identification of Coal-Rock Type Based on Boring Parameters of Dig Windlass and XGBoost	73
<i>Guoqiang Huang, Chengjin Qin, Ruihong Wu, Jianfeng Tao, Chengliang Liu</i>	
Multi-Actuator Integrated Control Design for Freighter Cargo Door	90
<i>Lin Li, Hao Wu, Zhao Xue, Xiaolu Wang, Shuai Liu, Zhenjin Nie</i>	
Experimental Investigation on the New 100N Bipropellant Space Rocket Engine	101
<i>Jinghuai Huang, Jie Zhang, Fengshan Wang, Zhen Zhang, Xiaofang Mao, Zhaopu Yao</i>	
Research of Highly Reliable Drive and Control Technology Based on APSOC	116
<i>Lijuan Zhang, Shouhao Wang, Qian Song, Yan Li, Weiyi Hao</i>	
Application of Multiphase Interleaving Parallel Technology in Oilfield Energy Storage Power Supply	125
<i>Chao He, Tao Jiang, Wang Qu</i>	
Wear Modelling of the Thread Pair in a Planetary Roller Screw Mechanism	146
<i>Shangjun Ma, Qianjin Xu, Chuangchuang Li, Jianxin Zhang, Geng Liu</i>	
Research on Closed-Loop Control and Flow Noise for Piezoelectric Type Micro Flow Controller for Electric Propulsion	167
<i>Yingying Zhang, Xudong Wang, Xinju Fu, Zhanhai Zhang, Zongliang Li, Zhiping Li</i>	
Simulation and Experiment of Worm Gear Thermal Deformation and Transmission Error	180
<i>Yong Zheng, Hao Huang, Yan Chen, Donglin Peng, Ziran Chen</i>	

Optimization of Low Frequency Oscillation of Variable Piston Chamber in High-Speed Aviation Pump.....	194
<i>Chun-Xiao Zhao, Bin Zhang, Yu Liu, Xiao-Hua Gou, Hao-Cen Hong, Wei-Dong Huang, Zhen-Wei Chang, Zhengyuan Zhang, Huayong Yang</i>	
Effects of Different Silt Particle Concentrations on Cavitation Evolution in the Centrifugal Pump.....	207
<i>Xiangdong Han, Youchao Yang, Chao Wang, Weiguo Zhao, Pengjun Fan</i>	
Intelligent Surrounding Rock Grade Identification Combining XGBoost Algorithm and Drilling Parameters of Drill Jumbo.....	216
<i>Guoqiang Huang, Chengjin Qin, Feixiang Liu, Ruihong Wu, Jianfeng Tao, Chengliang Liu, Jinjun Liao</i>	
Experimental Investigation on the Effects of Particle Concentrations on Cavitation Development in the Venturi Tube	235
<i>Xiangdong Han, Youchao Yang, Chao Wang, Pengjun Fan, Jianqi Hu</i>	
Research on Underwater Image Semantic Segmentation Method Based on SegNet	246
<i>Jialun Wang, Fusheng Zha, Xiuwen Bi</i>	
Fault-Tolerant Control for Five-Phase Permanent Magnet Synchronous Motor Servo System Based on Topological Reconstruction.....	256
<i>Jiwen Han, Hongzhou Song, Yinan Liu, Xiaqing Pei, Zaiping Zheng, Weiqi Liu</i>	
Investigation on Internal Flow Characteristics of a Pressure-Driven Swirling Injector for Urea-SCR System.....	267
<i>Youcheng Shi, Zheng Li, Wenbin Cao, Qingzhen Dong</i>	
EGR Intelligent Control of Diesel Engine Based on Deep Reinforcement Learning.....	284
<i>Chenguang Lai, Chaobing Wu, Sizheng Wang, Jiayi Li, Bo Hu</i>	
Research on Improved Resolver-To-Digital Conversion Method and Its Application Based on FPGA.....	295
<i>Qijia Zheng, Shuping Meng, Sixian Sun, Yang Jiang, Yang Hu</i>	
Analysis and Optimization on Mechanical Properties of Stern Shaft on an Underwater Vehicle	306
<i>Lei Liu, Cairui Yue, Juan Wei, Zhihui Wang, Zengwu Zhao</i>	
Magnetic Structure Design for Frictionless Proportional Solenoid Valve Based on Large Leaky Magnetic Circuit.....	314
<i>Xu-Dong Wang, Shuiming Tan, Zhen Zhang, Liang Zhang, Chen-Guang Gao, Huanchun Wang</i>	
Comparative Study of Air-Gap Field Distribution Characteristics Among Different Pole Array in SPM.....	325
<i>Xinghua He, Liang Yan, Xiaoshan Gao, Pengjie Xiang, Chris Gerada</i>	
Comparison of PMSM and BLDC Applications in Servo System	337
<i>Qiangqiang Lin, Qijia Zheng, Shiliang Miao, Yan Li, Ruijing Zhao</i>	
Design of Controllable Power System for Underwater Transmission Mechanism.....	345
<i>Pengtao Mou, Zhishu Xu, Jingjing Bao, Jiating Zhu, Zhipeng Zheng</i>	
Research on a Novel Multi-Pump and Multi-Motor Driving System.....	351
<i>Qiaoyan Liu, Zhongxun Liu, Yuhang Liu, Jihai Jiang</i>	

Simulation Analysis and Experimental Study on the Effect of Valve Opening on Flow Measurement Based on Micro-Channel.....	367
<i>Xin-Ju Fu, Ping Wang, Yong Li, Zhao-Xin Shi, Xu-Dong Wang, Tai-Zeng Lv</i>	
Numerical Investigation of Effects of Rectangular Structure on Cavitation Evolution Around NACA0015 Hydrofoil.....	383
<i>Yanyan Wang, Weiguo Zhao, Chao Wang, Xiangdong Han, Pengjun Fan, Zailun Liu</i>	
Numerical Investigation on Effects of Solid Grain Concentrations on Cavitation Evolution Around NACA0015 Hydrofoil.....	396
<i>Xiangdong Han, Chao Wang, Youchao Yang, Weiguo Zhao, Pengjun Fan</i>	

Author Index