

Fifth International Conference on Physics, Mathematics and Statistics

Journal of Physics: Conference Series Volume 2313

Online
21-22 May 2022

Editor:

Wanyang Dai

ISBN: 978-1-7138-6035-8
ISSN: 1742-6588

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.

This work is licensed under a Creative Commons Attribution 3.0 International Licence.
Licence details: <http://creativecommons.org/licenses/by/3.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

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

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.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
Web: www.proceedings.com

TABLE OF CONTENTS

Preface <i>Wanyang Dai</i>	
Peer Review Statement	
Impact of Pitot Tube Diameter on the Centre Line Mean Flow Velocity in Multi-Scale Grid-Generated Turbulence.....	1
<i>Hiroto Yamaguchi, Hiroki Suzuki, Kento Tanaka, Toshinori Kouchi</i>	
Lax-Wendroff Method for Incompressible Flow	8
<i>Md Mizanur Rahman, K. Hasan, Zhiqian Sang, Zing Ni</i>	
Study on Aerodynamic Characteristics of Flying Wing Knapsack Inlet Duct.....	18
<i>Shang Ma, Yang Tao, Junqiang Wu, Neng Xiong, Xingya Da</i>	
A Quick Surface Heat Flux Estimation Method for Typical Structures of High-Speed Aircrafts.....	26
<i>Long Wu, Feng Wang, Qi Wang, Yiyu Han, Zhengzhou Li</i>	
Numerical Visualisation on Applying a Five-Stage Multi-Scaled Square Turbulence-Generating Grid to Generating Turbulence	36
<i>Hiroki Suzuki</i>	
Uncertainty Analysis and Visualization for a Coupled Thermohydraulics-Neutronics Simulation by Deterministic Sampling	46
<i>Wen Yang, Jun Huang, Zhaofei Tian, Guangliang Chen</i>	
Uncertainty Analysis of Velocity Field Calibration in Wind Tunnels Based on GUM and MCM	57
<i>Yufeng Du, Neng Xiong, Jun Lin</i>	
Development of a Single-Scale Initial Flow Field into Steady Homogeneous Turbulence with Validating a Constructed Fourier Spectral Analysis	64
<i>Hiroki Suzuki, Toshinori Kouchi</i>	
Flow Structure of Pitched and Skewed Microjet Vortex Generator Array.....	80
<i>Xingya Da, Yuan Yi, Yue Zhang, Longkai Guo, Yang Tao</i>	
Improved Theory of the Elastic-Plastic Response of Spherical Containment Vessels Subjected to Internal Blast Loading and Its Application	91
<i>Zeng He, Zhihuan Wang, Baihua Zhang, Leiming Jia, Zhou Tian</i>	
An Analytical Method for the Spherical Stress Wave Equation in Linear Hardening Materials	104
<i>Zhihuan Wang, Zhou Tian, Shufei Wang, Feng Chen, Zeng He, Leiming Jia</i>	
Development of Monte Carlo Based Treatment Planning System for BNCT	115
<i>Jiang Chen, Yi-Chiao Teng, Wan-Bing Zhong, Hai-Bo Yang, Qing Hong, Yuan-Hao Liu</i>	
Synchronization Time in Two Coupled Cluster Networks Based on Discontinuous Map.....	122
<i>Yunfeng Yang, Xue Bai</i>	
A Novel Voltage Protection Method for Multi-Cell Lithium-Ion Battery Protection IC	129
<i>Zhijian Chen, Xinyi Wu, Bin Li, Xiaoling Lin, Rui Xiao, Guangyin Feng, Yanjie Wang</i>	

Construction and Properties Analysis of Z-A-Z Graphene Nanoribbons Transistors.....	136
<i>Hanxi Wang, Yuanzhi Ding, Guojun Li, Yuxuan Song</i>	
Cascade Integration of Nonlinear Phenomena Exhibited by Monometallic Nanoparticles.....	143
<i>Soledad D. Estrada-León</i>	
Anticorrosive Behavior Assessment of Electrodeposited Zinc Salicylate Coating on Carbon Steel.....	150
<i>Ronghui Yuan, Yan Li, Xiangyu Ye, Furong Liu, Qiping Tian, Qiwan Wu</i>	
Simulation System of Lighting Environment for Optical Imaging Test.....	157
<i>Lei Zhang, Yu Yang, Shuai Zhao, Wenbin Xu, Bolin Cai, Keyi Wang</i>	
Oscillating Charge Currents of One-Dimensional Hubbard Model in Electric Field.....	164
<i>Yong Zheng</i>	
A Study of Lightning Electromagnetic Effect on the Metal Roof Constructions	170
<i>Biao Zhang, Xue Jiao, Junchi Zhou, Jiayi Mao, Yuzhi Wang</i>	
Study on Thrust Performance of Small Water Rocket Launch.....	180
<i>Yuqi Yang, Longbin Liu, Moyan Chen</i>	
Simulation of Gradient Floating Field Limiting Rings for 4H-SiC Power Devices.....	187
<i>Xiuxiu Gao, Xiaoping Dai</i>	
Analysis of Discharge Characteristics of Pulsed Plasma Power Source in the Microsecond Scale	193
<i>Qian Zhang, Zhiheng Liu, Deling Lin, Yuzhe Hu, Borui Zheng, Taifei Zhao</i>	
Numerical Analysis and Optimization of Radio-Frequency Ion Trap Potential	200
<i>Yuhan Liu, Lijun Du, Yuling He, Shiyi Huang, Qiang Zhang, Keliang He, Yulong Tang, Yansong Meng, Shenghua Zhai</i>	
The Dominant Mechanism of Gold Film Damage Induced by Near-Threshold Femtosecond Laser: Non-Thermal Deformation Or Thermal Ablation.....	208
<i>Ke Zhang, Jingya Sun</i>	
Theoretical Simulation on Fraunhofer Diffraction of Arbitrarily Shaped Aperture.....	215
<i>Yuanshuo Liu, Luyan Wang, Jia Dong, Jihao Xia, Lei Yang, Yi Jin</i>	
Upper Critical Field Beyond Pauli Limit in the Exfoliated RbCr ₃ As ₃ Nanowires	222
<i>Xiaomei Hu, Zhiyi Liu, Xingyuan Hou</i>	
Exact Calculation of the Elastic Antiferromagnetic Ising Model Under Static External Force on Husimi Lattice	229
<i>Xinyi Ning, Lisheng Tang, Xiaoyan He, Ran Huang, Xin Ma</i>	
A Novel Dynamic Mechanical Analysis Device to Measure the In-Vivo Material Properties of Plantar Soft Tissue and Primary Finite Elementary Analysis Results	236
<i>Longyan Wu, Jun Zhu, Jun Zheng, Xiang Geng, Xiaoyan He, Lisheng Tang, Ran Huang, Xin Ma</i>	
Statistical Evaluation of PMMA Surface Roughness	243
<i>Zvikomborero Hweju, Fundiswa Kopi, Khaled Abou-El-Hossein</i>	
A Reliability Estimation Method for Spring Group Balanced System at Different Degradation Temperatures	250
<i>Haodi Ji, Xiaobing Ma, Yanyan Wang</i>	

Radiation Evaluation of Household Appliances and Stone Materials from Residences in Hangzhou 257
Xiangyu Zhang, Fang Zheng, Xiaodong Wu, Qiuxiang Liu, Jun Jiang, Zhangsen Chen

Reliability Evaluation of Balanced Systems with Common Bus Performance Sharing Considering
Balance Degree Base on Battery Storage Systems..... 264
TianZi Tian, Jun Yang

Author Index