



EI COMPENDEX
核心期刊

ISSN 0459-1879
CN 11-2062/O3

力学学报

Chinese Journal of Theoretical and Applied Mechanics

第 54 卷 第 3 期 Vol. 54 No. 3

2022



中国科学院力学研究所 主办
中国力学学会
力学学报期刊社 出版

万方数据



力学学报 (月刊)

Chinese Journal of Theoretical and
Applied Mechanics

1957 年 创刊

2022 年

第 54 卷 第 3 期

目 次

研究综述

基于神经网络的偏微分方程求解方法研究综述 查文舒 李道伦 沈路航 张 雯 刘旭亮 (543)

发动机中的关键流体力学问题专题

发动机中的关键流体力学问题专题序 连 欢 (557)

压气机流动稳定性自适应控制方法研究进展 许登科 董 旭 徐瑞泽 李 佳 孙大坤 孙晓峰 (559)

带冷却气流的亥姆霍兹共振器的声类比模型 甘振鹏 杨 东 (577)

超燃冲压发动机仿真: 从数值飞行到数智飞行 孙明波 安 彬 汪洪波 王成龙 (588)

基于局部偏转吻切方法的多级压缩乘波体设计 郑晓刚 朱呈祥 尤延铖 (601)

乙烯燃料超燃燃烧室流动特性与燃烧稳定性研究 时 文 田 野 郭明明 刘 源 张辰琳 钟富宇 乐嘉陵 (612)

飞行 Ma_{12} 条件超燃发动机流场及燃烧特征分析 何 粲 邢建文 欧阳浩 邓维鑫 肖保国 (622)

提高高马赫数超燃冲压发动机推力的理论方法 韩 信 刘云峰 张子健 张文硕 马凯夫 (633)

Oldroyd-B 黏弹性液滴碰撞过程的数值模拟 关新燕 富庆飞 刘 虎 杨立军 (644)

流体力学

弹性支撑斑海豹胡须模型单自由度流致振动实验研究 宋立群 及春宁 袁德奎 许 栋 张晓娜 卫昱含 殷 彤 (653)

基于扭摆的微冲量测量方法及实验研究 杨 超 贺建武 章 楚 康 琦 段 俐 (669)

基于双向流固耦合的超空泡射弹入水研究 郝常乐 党建军 陈长盛 黄 闯 (678)

高超声速风洞短时气动力智能辨识算法研究 王钦超 李世超 高宏力 马贵林 伍 广 段志琴 (688)

固体力学

板状结构自发大变形问题的三维数值分析 张默涵 李录贤 (697)

基于细观拓扑结构演化的颗粒材料剪胀性分析 刘嘉英 周 伟 姬 翔 魏 纲 袁思莹 李欣骏 (707)

Nb_3Sn 高场复合超导体临界性能力学变形效应的多尺度模拟 ... 杨绪佳 何宇新 张 鑫 杨小敏 王 涛 乔 力 (719)

无网格动力分析的循环卷积神经网络代理模型 陈 健 王东东 刘宇翔 陈 俊 (732)

动力学与控制

基于 SE(3) 群局部标架的 5/6 Dofs CB 壳单元 张 腾 刘 铖 张志娟 刘绍奎 (746)

平稳/非平稳激励下中厚圆柱壳随机振动响应的基准解 霍 慧 陈国海 王文培 杨迪雄 (762)

存在关节死区的空间机器人无扰快速终端滑模控制 张智豪 于潇雁 (777)

计及短周期误差的直齿轮副近周期运动及其辨识 刘鹏飞 朱凌云 苟向锋 石建飞 金国光 (786)

生物、工程及交叉力学

混凝土动态双轴拉压破坏准则细观数值模拟研究 金 浏 李 健 余文轩 杜修力 (800)

气相爆轰驱动二级轻气炮内弹道数值模拟 尚甲豪 邢好运 汪 球 李进平 赵 伟 魏炳忱 (710)

基于时程深度学习的流场特征分析方法 战庆亮 白春锦 葛耀君 (822)

Chinese Journal of Theoretical and Applied Mechanics

(Monthly)

Vol. 54, No. 3, 2022

CONTENTS

Research Review

Review of neural network-based methods for solving partial differential equations Zha Wenshu, Li Daolun, Shen Luhang, Zhang Wen, Liu Xuliang (543)

Theme Articles on Fluid Mechanics in Engines

Preface of theme articles on fluid mechanics in engines Lian Huan (557)

Research progress of adaptive control methods for compressor flow stability Xu Dengke, Dong Xu, Xu Ruize, Li Jia, Sun Dakun, Sun Xiaofeng (559)

An acoustic analogy model for Helmholtz resonators with cooling bias flow Gan Zhenpeng, Yang Dong (577)

Numerical simulation of the scramjet engine: from numerical flight to intelligent numerical flight Sun Mingbo, An Bin, Wang Hongbo, Wang Chenglong (588)

Design of multistage compression waverider based on the local-turning osculating cones method Zheng Xiaogang, Zhu Chengxiang, You Yancheng (601)

Investigation of flow characteristics and flame stabilization in an ethylene-fueled scramjet combustor Shi Wen, Tian Ye, Guo Mingming, Liu Yuan, Zhang Chenlin, Zhong Fuyu, Le Jialing (612)

Flow field and combustion characteristics analysis of scramjet under *Ma*12 flight condition He Can, Xing Jianwen, Ouyang Hao, Deng Weixin, Xiao Baoguo (622)

The theoretical method to increase the thrust of high Mach number scramjets Han Xin, Liu Yunfeng, Zhang Zijian, Zhang Wenshuo, Ma Kaifu (633)

Numerical simulation of Oldroyd-B viscoelastic droplet collision Guan Xinyan, Fu Qingfei, Liu Hu, Yang Lijun (644)

Fluid Mechanics

Single degree-of-freedom flow-induced vibration of an elastically-supported harbor seal whisker model: An experimental study Song Liquan, Ji Chunming, Yuan Dekui, Xu Dong, Zhang Xiaona, Wei Yuhua, Yin Tong (653)

Micro impulse measurement method and experimental research based on torsion pendulum Yang Chao, He Jianwu, Zhang Chu, Kang Qi, Duan Li (669)

Numerical study on water entry process of supercavitating projectile by considering bidirectional fluid structure interaction effect Hao Changle, Dang Jianjun, Chen Changsheng, Huang Chuang (678)

Research on intelligent identification algorithms for short-term aerodynamics of hypersonic wind tunnels Wang Qinchao, Li Shichao, Gao Hongli, Ma Guilin, Wu Guang, Duan Zhiqin (688)

Solid Mechanics

Three-dimensional numerical analysis of spontaneous large-deformation of plate-like structures Zhang Mohan, Li Luxian (697)

Dilatancy analysis of granular materials based on mesoscopic topological evolutions Liu Jiaying, Zhou Wei, Ji Xiang, Wei Gang, Yuan Siying, Li Xinjun (707)

Multiscale simulation of mechanical deformation effects on critical properties of Nb₃Sn high field composite superconductors Yang Xujia, He Yuxin, Zhang Xin, Yang Xiaomin, Wang Tao, Qiao Li (719)

A recurrent convolutional neural network surrogate model for dynamic meshfree analysis Chen Jian, Wang Dongdong, Liu Yuxiang, Chen Jun (732)

Dynamics, Vibration and Control

5/6 Dofs CB shell elements based on the local frame of SE(3) group Zhang Teng, Liu Cheng, Zhang Zhijuan, Liu Shaokui (746)

Benchmark solutions of random vibration responses for moderately thick cylindrical shells under stationary/nonstationary excitations Huo Hui, Chen Guohai, Wang Wenpei, Yang Dixiong (762)

Reactionless terminal sliding mode control of space robot with joint dead-zone Zhang Zhihao, Yu Xiaoyan (777)

Neighboring periodic motion and its identification for spur gear pair with short-period errors Liu Pengfei, Zhu Lingyun, Gou Xiangfeng, Shi Jianfei, Jin Guoguang (786)

Biomechanics, Engineering and Interdisciplinary Mechanics

Mesoscopic numerical simulation on dynamic biaxial tension-compression failure criterion of concrete Jin Liu, Li Jian, Yu Wenxuan, Du Xiuli (800)

Numerical research on interior ballistics of the two-stage light gas gun driven by gaseous detonation Shang Jiahao, Xing Haoyun, Wang Qiu, Li Jinping, Zhao Wei, Wei Bingchen (810)

Fluid feature analysis based on time history deep learning Zhan Qingliang, Bai Chunjin, Ge Yaojun (822)