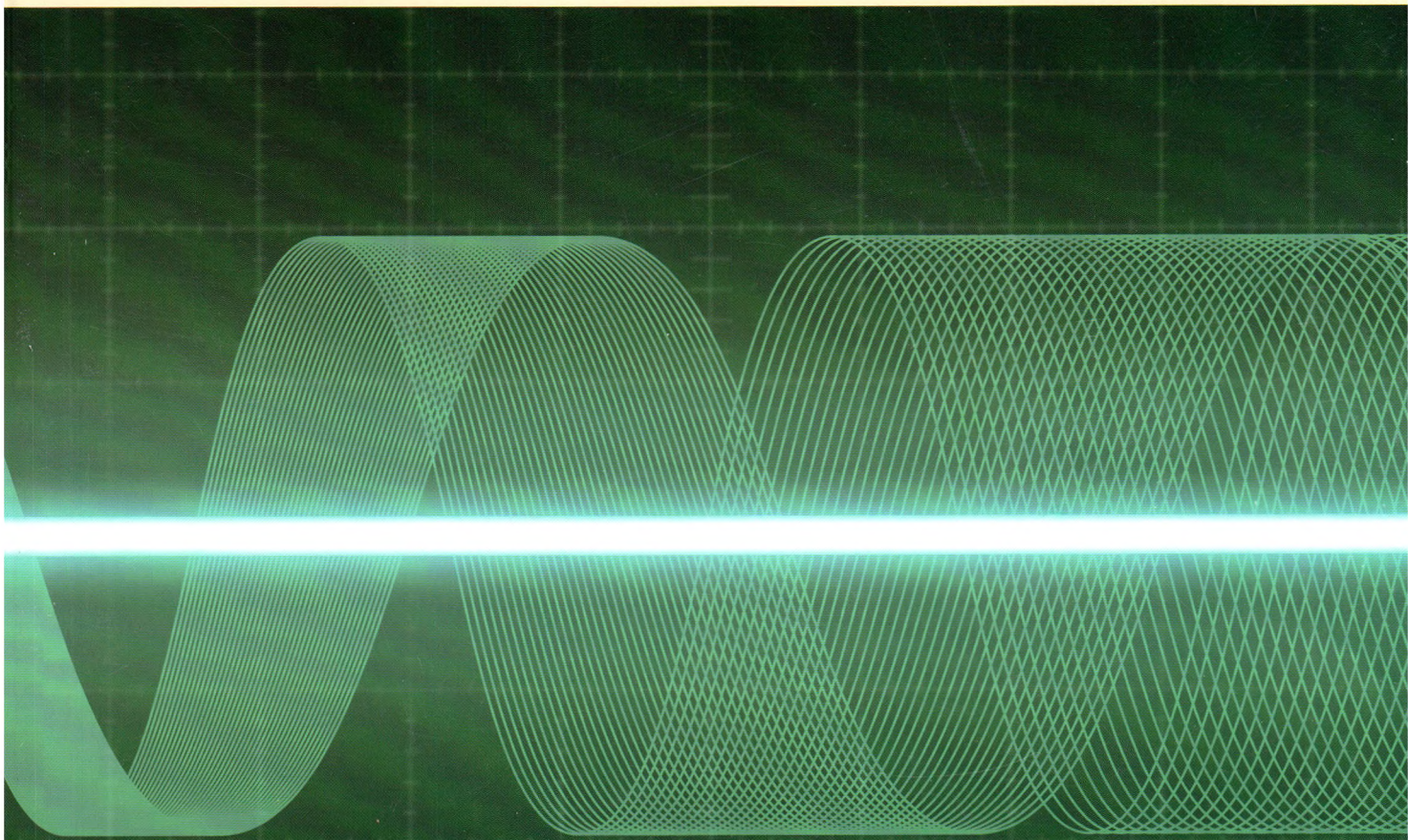


QK17071142  
CN 31-1316/TU

# 振动与冲击

JOURNAL OF VIBRATION AND SHOCK



ZHENDONG YU CHONGJI

半月刊 | 第36卷 | 9/2017

ISSN 1000-3835



9 771000 383172

万方数据

中国振动工程学会  
上海交通大学 主办  
上海市振动工程学会



## 目 次

|   |                                    |
|---|------------------------------------|
| 四列角接触球轴承振动特性研究·····                           | 邓四二, 卢羽佳, 华显伟, 等 (1)               |
| 汽车驱动桥系统模态综合动力学建模与分析·····                      | 周 驰, 丁炜琦, 桂良进, 等 (7)               |
| 重力坝均匀冲击破坏模型试验研究 ·····                         | 顾培英, 邓 昌, 肖仕燕, 等 (13)              |
| 约束阻尼结构的改进准则法拓扑减振动力学优化 ·····                   | 贺红林, 袁维东, 夏自强, 等 (20)              |
| 基于时间-小波能量谱样本熵的滚动轴承智能诊断方法 ·····                | 邓飞跃, 唐贵基 (28)                      |
| 基于性能的相邻结构间 Maxwell 阻尼器优化布置研究 ·····            | 吴巧云, 朱宏平, 陈旭勇 (35)                 |
| 基于最小熵解卷积和 Teager 能量算子直升机滚动轴承复合故障诊断研究<br>····· | 陈海周, 王家序, 汤宝平, 等 (45)              |
| 二维声学黑洞对弯曲波的能量聚集效应 ·····                       | 黄 薇, 季宏丽, 裘进浩, 等 (51)              |
| 一种滚动轴承特征频率的自动识别方法研究 ·····                     | 高大为, 朱永生, 刘煜炜, 等 (58)              |
| 突然开孔结构风致瞬态内压极值研究 ·····                        | 余先锋, 段 旻, 谢壮宁 (63)                 |
| 倾斜旋转型三维隔震装置的力学模型和竖向性能试验研究 ···                 | 刘文光, 余宏宝, IMAM MOUSTAFA I., 等 (68) |
| 含裂纹故障的齿轮系统动力学特性研究及其故障特征分析 ·····               | 王 旭, 伍 星, 肖正明, 等 (74)              |
| 细长密闭管道内油气爆炸特性研究 ·····                         | 王 波, 杜 扬, 李国庆, 等 (80)              |
| 基于正交数值试验的反应装甲干扰射流参数敏感性研究 ·····                | 拜云山, 冯晓伟, 梁 斌, 等 (86)              |
| 一种绳牵引摄像机器人的运动控制策略与稳定性研究 ·····                 | 韦慧玲, 仇原鹰, 盛 英 (93)                 |
| $L_2$ 范数拟合正则化方法在飞行器动态载荷识别中的应用 ·····           | 高 伟, 于开平, 盖晓男 (101)                |
| 基于圆域分析的大型回转支承初期故障诊断·····                      | 封 杨, 黄筱调, 洪荣晶, 等 (108)             |
| 基于小波和乘法混合核函数 LSSVM 的顺风向非高斯空间风压预测 ·····        | 迟恩楠, 李春祥, 郑晓芬 (116)                |
| 基于多元 Copula 函数的桥梁体系地震易损性分析方法研究 ·····          | 宋 帅, 钱永久, 吴 刚 (122)                |
| 基于 EEMD 与 GA-小波神经网络的传动系声品质预测 ·····            | 黄海波, 黄晓蓉, 苏瑞强, 等 (130)             |
| 非平稳随机地震响应约束下的桁架结构形状与拓扑优化·····                 | 李雪平, 李栋泓, 魏 鹏, 等 (138)             |
| 万方数据  |                                    |

|   |                        |
|---|------------------------|
| 饱和多孔介质不同动力耦合形式数值分析·····                     | 刘宝, 苏谦, 刘亭, 等 (146)    |
| 自适应小波阈值去噪算法在低空飞行声目标的应用·····                 | 黎锁平, 周勇, 周永强 (153)     |
| 杯形工具复合变幅杆设计及振动特性分析·····                     | 陈汇资, 赵波, 赵金坠, 等 (159)  |
| 基于飞机竖向加速度的道面不平度限值标准研究·····                  | 程国勇, 侯栋文, 黄旭栋 (166)    |
| 柔性棚洞结构落石冲击数值模拟与试验研究·····                    | 杨建荣, 白羽, 杨晓东, 等 (172)  |
| 一种体外预应力钢筋混凝土摇摆框架抗震性能研究·····                 | 鲁亮, 刘霞 (179)           |
| 基于道路试验的制动器蠕动颤振客观测量与主观评价·····                | 张立军, 黄健, 孟德建, 等 (186)  |
| 机枪冲击作用下的人体动力学响应研究·····                      | 张本军, 王瑞林, 郑立评, 等 (195) |
| 变曲率 FGM 拱的面内自由振动分析·····                     | 李万春, 滕兆春 (201)         |
| 水下爆炸作用下高速摄像机抗冲隔振系统设计与动态特性分析·····            | 高浩鹏, 张姝红, 冯麟涵 (209)    |
| Y形高强钢组合偏心支撑框架结构抗震性能简化分析方法研究·····            | 连鸣, 苏明周, 郭艳 (214)      |
| 悬架分块动力学模型的在线系统参数与外扰识别研究·····                | 郝慧荣, 张慧杰 (225)         |
| 内爆炸作用下公轨合建盾构法隧道非封闭式内衬结构动力响应及抗爆性能分析<br>····· | 张景, 封坤, 何川, 等 (231)    |

**第十届全国振动理论及应用学术会议推荐论文**

|                               |                        |
|-------------------------------|------------------------|
| 基于负刚度机构的高刚度-超阻尼隔振器设计与研究·····  | 董光旭, 张希农, 谢石林, 等 (239) |
| 地铁致地表振动局部放大现象实测与机理分析·····     | 宗刚, 张永红, 任晓崧 (247)     |
| 行星齿轮箱典型故障对内齿圈齿根应变的作用机理研究····· | 牛杭, 张小栋, 赵欣丹, 等 (253)  |
| 超高斯随机振动疲劳加速试验模型研究·····        | 蒋瑜, 陶俊勇, 陈循 (261)      |

**本期广告索引**

**彩色广告**

- 封二 扬州英迈克测控技术有限公司
- 封三 北京东方振动和噪声技术研究所
- 封四 北京声望声电技术有限公司
- 前插1 杭州亿恒科技有限公司
- 前插2 德国 m+p 国际公司北京代表处
- 前插3 德维创中国有限公司

后插4 PCB 压电传感技术(北京)有限公司

**彩色广告**

- 后插1 南京安正软件工程有限公司
- 后插2 南京安正软件工程有限公司
- 后插3 上海君协光电科技发展有限公司
- 后插4 上海君协光电科技发展有限公司

# CONTENTS

|  |   |
|--|---|
| Vibration characteristics of four-column angular contact ball bearings<br>.....  | DENG Sier, LU Yujia, HUA Xianwei, et al (1)             |
| Modal synthesis dynamic modeling and analysis for an automotive drive axle system<br>.....   | ZHOU Chi, DING Weiqi, GUI Liangjin, et al (7)           |
| Damage model tests for a gravity dam under uniform shock load<br>.....   | GU Peiying, DENG Chang, XIAO Shiyan, et al (13)         |
| Topology optimization of plates with constrained damping based on improved optimal criteria<br>.....                                     | HE Honglin, YUAN Weidong, XIA Ziqiang, et al (20)       |
| An intelligent method for rolling element bearing fault diagnosis based on time-wavelet energy spectrum sample entropy<br>.....          | DENG Feiyue, TANG Guiji (28)                            |
| Performance-based optimal arrangement of Maxwell dampers between two adjacent structures<br>.....  | WU Qiaoyun, ZHU Hongping, CHEN Xuyong (35)              |
| Helicopter rolling bearing hybrid faults diagnosis using minimum entropy deconvolution and Teager energy operator<br>.....               | CHEN Haizhou, WANG Jiaxu, TANG Baoping, et al (45)      |
| Energy focusing effect of Two-dimensional acoustic black hole on flexural waves<br>.....   | HUANG Wei, JI Hongli, QIU Jinhao, et al (51)            |
| An automatic recognition method for characteristic frequency of rolling bearings<br>.....  | GAO Dawei, ZHU Yongsheng, LIU Yuwei, et al (58)         |
| Extreme value of wind-induced transient internal pressure of buildings suffering sudden opening<br>.....                                 | YU Xianfeng, DUAN Min, XIE Zhuangning (63)              |
| Tests for mechanical model of an inclined rotational three-dimensional seismic isolation device and its vertical performance<br>.....    | LIU Wenguang, YU Hongbao, IMAM MOUSTAFA I. , et al (68) |
| Dynamic characteristics of a gear system with crack fault and its fault feature analysis<br>.....  | WANG Xu, WU Xing, XIAO Zhengming, et al (74)            |
| Tests for explosion characteristics of gasoline-air mixture in an elongated closed tube<br>.....   | WANG Bo, DU Yang, LI Guoqing, et al (80)                |
| Parametric sensitivity of explosive reactive armor disturbance jet based on orthogonal numerical tests<br>.....                          | BAI Yunshan, FENG Xiaowei, LIANG Bin, et al (86)        |
| Motion control strategy and stability of a cable-based camera robot<br>.....   | WEI Huiling, QIU Yuanying, SHENG Ying (93)              |
| Application of $L_{\infty}$ norm fitting regularization method in dynamic load identification of space-crafts<br>.....                   | GAO Wei, YU Kaiping, GAI Xiaonan (101)                  |
| Incipient fault diagnosis of large-size slewing bearings based on circular domain analysis<br>.....                                      | FENG Yang, HUANG Xiaodiao, HONG Rongjing, et al (108)   |
| Forecasting non-Gaussian spatial along-wind pressure using wavelet kernel and multiplicative mixed kernel functions based LSSVM<br>..... | CHI Ennan, LI Chunxiang, ZHENG Xiaofen (116)            |
| Seismic fragility analysis of a bridge system based on multivariate Copula function<br>.....   | SONG Shuai, QIAN Yongjiu, WU Gang (122)                 |

---

|  |   |
|--|---|
| Sound metric prediction of a power train system based on EEMD and GA-wavelet neural network<br>.....   | HUANG Haibo, HUANG Xiaorong, SU Ruiqiang, et al (130) |
| Shape and topology optimization of truss structures under non-stationary stochastic seismic excitations<br>.....   | LI Xueping, LI Donghong, WEI Peng, et al (138)        |
| Numerical simulation for different dynamic coupling forms of saturated porous media<br>.....   | LIU Bao, SU Qian, LIU Ting, et al (146)               |
| An adaptive wavelet shrinkage de-noising algorithm for low altitude flying acoustic targets<br>.....   | LI Suoping, ZHOU Yong, ZHOU Yongqiang (153)           |
| Design of a cup horn and its vibration characteristics analysis<br>.....   | CHEN Huizi, ZHAO Bo, ZHAO Jinzhui, et al (159)        |
| Pavement roughness limit value standard based on aircraft vertical acceleration<br>.....   | CHENG Guoyong, HOU Dongwen, HUANG Xudong (166)        |
| Numerical simulation and tests for flexible rock shed subjected to rackfall impact<br>.....  | YANG Jianrong, BAI Yu, YANG Xiaodong, et al (172)     |
| Aseismic performance of an external prestressed rocking reinforced concrete frame .....  | LU Liang, LIU Xia (179)                               |
| Objective measurement and subjective evaluation for brake creep groan based on road tests<br>.....   | ZHANG Lijun, HUANG Jian, MENG Dejian, et al (186)     |
| Dynamic response of human body under impact of machine gun<br>.....  | ZHANG Benjun, WANG Ruilin, ZHENG Liping, et al (195)  |
| In-plane free vibration analysis of FGM arches with variable curvature .....   | LI Wanchun, TENG Zhaochun (201)                       |
| Design and dynamic characteristics analysis for a high-speed camera's anti-shock and vibration isolation system<br>subjected to underwater explosion .....               | GAO Haopeng, ZHANG Shuhong, FENG Linhan (209)         |
| A simplified analysis method for a seismic behaviors of Y-type high strength steel composite eccentrically braced<br>frames .....  | LIAN Ming, SU Mingzhou, GUO Yan (214)                 |
| Online recognition of system parameters and external excitations for a vehicle block suspension dynamic model<br>.....   | HAO Huirong, ZHANG Huijie (225)                       |
| Dynamic response and anti-explosion behavior analysis for combined railway and roadway shield tunnel's unclosed<br>inner lining structure under internal explosion ..... | ZHANG Jing, FENG Kun, HE Chuan, et al (231)           |
| Design of a high stiffness and hyper-damping vibration isolator based on negative stiffness mechanism<br>.....   | DONG Guangxu, ZHANG Xinong, XIE Shilin, et al (239)   |
| In-situ measurement and mechanism analysis for Local amplification phenomena of metro induced ground-borne<br>vibration .....  | ZONG Gang, ZHANG Yonghong, REN Xiaosong (247)         |
| Action mechanism of planetary gearbox's typical faults on tooth root strain of ring gear<br>.....  | NIU Hang, ZHANG Xiaodong, ZHAO Xindan, et al (253)    |
| Super-Gaussian random vibration fatigue accelerated testing model .....  | JIANG Yu, TAO Junyong, CHEN Xun (261)                 |

---

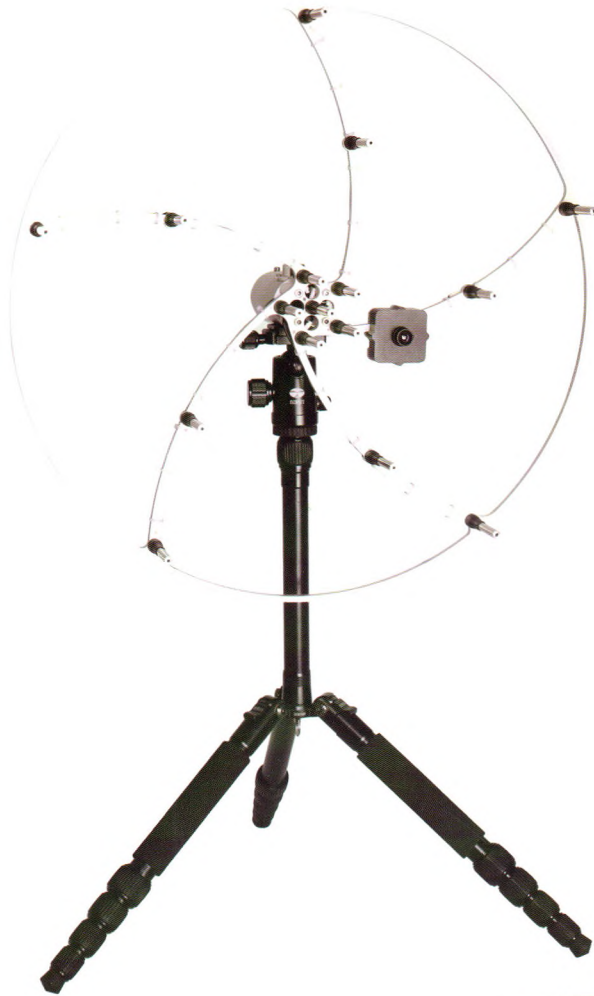
## JOURNAL OF VIBRATION AND SHOCK

Vol. 36 No. 9 MAY 2017

Editorial Office: 1954 Huashan Rd. Shanghai, 200030, China

Issuer Abroad: China National Publishing Industry Trading Corporation

(Post-Office Box No. 728, Beijing, China)



## 传声器及声阵列



声望公司生产和销售测量传声器已有15年历史。我们为客户提供1英寸、1/2英寸及1/4英寸的I、II型传声器；应用领域包括自由场、压力场及扩散场；供电方式包括ICCP®预极化0V供电、48V幻象供电及200V供电。

声望公司的传声器性价比优越，稳定性好，客户包括多个国外声级计生产厂商。

声望公司还可按照客户要求，设计和制造传声器阵列。产品包括一字、十字、螺旋及无规则形状阵列。阵列用传声器可选用声望公司专有的MPA201及MPA416阵列传声器，该系列传声器相位匹配度高，适用于高精度阵列测量。



微信二维码

### BSWA 声望技术

#### 总部

北京声望声电技术有限公司 地址：北京市西城区裕民路18号北环中心1002-1003室 邮编：100029  
电话：400 060 3060 传真：010-82251626 Email: bswa@bswa.com.cn Website: www.bswa.com.cn

#### 广州办事处

地址：广州市海珠区广州大道南855号敦和商务公寓A栋M03室 电话/传真：020-84217929