

全国中文核心期刊  
中国科技核心期刊  
中国科学引文数据库核心期刊

ISSN 1000-0844  
CN 62-1208/P  
CODEN: XDIXEF

地震工程学报

# 地震工程学报

CHINA EARTHQUAKE ENGINEERING JOURNAL

第四十四卷

第五期

2022 5

第44卷 第5期  
Vol. 44 No. 5  
2022年9月出版

ISSN 1000-0844



9 771000 084222

主管单位：中国地震局  
主办单位：中国地震局兰州地震研究所  
清 华 大 学  
中国地震学会  
中国土木工程学会

二〇二二年九月

# 地震工程学报

DIZHEN GONGCHENG XUEBAO

第 44 卷 第 5 期 2022 年 9 月

## 目 次

### 地震工程

- 基于波动理论的结构损伤识别研究进展 ..... 戴东利, 杨汉青, 杨 翔, 何 伟 (1001)  
考虑初始倾斜的风机塔近场抗震可靠度分析 ..... 徐亚洲, 时文浩, 任倩倩 (1009)  
地下采煤情况下地表黄土边坡稳定性分析 ..... 马宗源, 焦 贝, 党发宁, 成玉祥 (1017)  
高烈度区深水斜拉桥动水效应及抗震体系研究 ..... 樊 冰, 李永庆, 宋松林, 安艳涛 (1024)  
铁路重力式桥墩墩底局部加密纵筋高度研究 ..... 丁明波, 鲁锦华, 陈兴冲, 马华军, 张熙胤 (1034)  
兰州重塑黄土抗拉强度冻融特性与衰减模型研究——基于轴向压裂法 .....  
..... 吴旭阳, 任明洋, 黄俊杰, 梁庆国, 王 园 (1041)  
地震作用下双层土裂缝边坡稳定性分析 ..... 梁承龙, 刘 芳 (1050)  
JGN 型耐高温建筑结构胶抗震加固性能研究 ..... 程希莹, 于 敏, 杨瑞敏, 张 伟, 韩 意 (1059)  
地震作用下黄土边坡动态滑动位移研究 ..... 尹小军, 王兰民 (1067)  
基于平面框架拟静力试验的 RC 框架柱的破坏模式研究 ..... 范晓庆, 郭 迅, 刘爱文, 李祥秀 (1074)  
一种基于时间序列与核岭回归的结构损伤定位方法 ..... 何定桥, 杨 军 (1082)  
地震作用下黄土边坡动力响应的时频特征分析 ..... 张兴臣, 梁庆国, 孙 文, 曹小平 (1090)  
地裂缝场地建筑结构动力响应特征及抗震设防研究 .....  
..... 杨兴凯, 邓亚虹, 常 江, 慕焕东, 曹 歌, 牛得鑫 (1100)  
山脊地形效应的强震动观测研究 ..... 周港圣, 周 游, 周正华, 魏 来, 魏 鑫, 沈欣茹, 陈 珍 (1110)

### 地震研究

- 华北盆地北缘香河—皇庄断裂晚更新世以来活动性研究 .....  
..... 潘志龙, 张 欢, 王 慧, 李庆喆, 卜 令, 石光耀, 张金龙 (1117)  
2022 年 1 月 23 日青海德令哈  $M_{\text{s}}5.8$  地震全矩张量反演及发震构造初步分析 .....  
..... 徐志国, 史健宇, 梁姗姗, 李宏伟, 邹立晔 (1128)  
三种方法分析 2017 年宁夏固原  $M_{\text{s}}4.6$  地震的震源机制解 ..... 许英才, 郭祥云, 曾宪伟 (1136)  
基于《建筑抗震设计规范》强度包线函数参数取值研究 ..... 余文正, 吴宗谦, 杨瑞欣, 兰 香 (1151)  
雄安新区  $v_{S30}$  经验估计研究 ..... 张 肖, 张 合, 刘思宇, 刘书峰 (1160)  
基于 MFCC 样本熵和灰狼算法优化支持向量机的天然地震与人工爆破自动识别 .....  
..... 庞 聪, 江 勇, 廖成旺, 吴 涛, 丁 炜 (1169)  
通州台井下地电阻率测深初步分析 ..... 崔博闻, 王同利, 李 然, 胡毅涛, 王丽红, 李菊珍 (1176)  
2011 年 3 月 10 日云南盈江  $M_{\text{s}}5.8$  地震的微震匹配定位与发震机理研究 .....  
..... 王 晓, 周振贵, 叶 青, 黄经国, 王亚璐, 余 丹, 王 军 (1185)

- 基于小波分解与同步挤压变换的西昌小庙台形变典型干扰的时频响应特征研究 .....  
..... 杨志鹏, 陈秀清, 余洋洋, 张御阳, 巫萌飞, 徐建明, 赵 晶, 张正伟 (1192)
- 河南省汤阴地堑南部土壤 H<sub>2</sub> 浓度及其与构造关系 .....  
..... 胡 宁, 娄露玲, 马志敏, 王明亮, 张宝山, 王 宇, 陈 蒙, 郭德科 (1207)
- 白龙江流域隐伏活断层的综合地球物理勘探 .....  
..... 谢兴隆, 王高峰, 李秋辰, 牛 雪, 叶振南, 马雪梅 (1216)
- 1890—2020 年伊朗  $M_s \geq 6.8$  地震时空对称性及趋势分析 .....  
..... 杨馥宁, 延军平, 王 婷, 肖 南, 朱春鸣 (1225)
- 基于改进 EWT 和 LogitBoost 集成分类器的地震事件分类识别算法 .....  
..... 孟 娟, 张家声, 李亚南 (1233)
- 伊朗高原及周边地区  $M_s \geq 7.1$  地震的时空对称性研究及趋势预判 .....  
..... 王晓枝, 延军平, 董治宝 (1243)

# CHINA EARTHQUAKE ENGINEERING JOURNAL

Vol. 44 No. 5 September, 2022

## CONTENTS

Recent advances in structural damage identification based on wave theory:a review .....	DAI Dongli, YANG Hanqing, YANG Xiang, HE Wei (1001)
Seismic reliability analysis of a wind turbine tower with initial tilt imperfection under near-field earthquake excitation .....	XU Yazhou, SHI Wenhao, REN Qianqian (1009)
Stability analysis of a loess slope with underground coal mining .....	MA Zongyuan, JIAO Bei, DANG Faning, CHENG Yuxiang (1017)
Hydrodynamic effect and seismic system of a deep-water cable-stayed bridge in high-seismic-intensity areas .....	FAN Bing, LI Yongqing, SONG Songlin, AN Yantao (1024)
Height of dense longitudinal reinforcement at the bottom of railway gravity bridge piers .....	DING Mingbo, LU Jinhua, CHEN Xingchong, MA Huajun, ZHANG Xiying (1034)
Freeze-thaw characteristic and attenuation model of tensile strength of Lanzhou remolded loess based on the axial splitting method .....	WU Xuyang, REN Mingyang, HUANG Junjie, LIANG Qingguo, WANG Yuan (1041)
Stability analysis of two-layered cracked slopes subjected to seismic excitation .....	LIANG Chenglong, LIU Fang (1050)
Seismic strengthening performance of JGN-type building structural adhesive with high temperature resistance .....	CHENG Xiying, YU Min, YANG Ruimin, ZHANG Wei, HAN Yi (1059)
Dynamic sliding displacement of loess slopes under earthquake action .....	YIN Xiaojun, WANG Lanmin (1067)
Failure mode of RC frame columns based on the plane frame quasi-static test .....	FAN Xiaoqing, GUO Xun, LIU Aiwen, LI Xiangxiu (1074)
A structural damage detection method based on time series and kernel ridge regression .....	HE Dingjiao, YANG Jun (1082)
Time-frequency characteristics of dynamic responses of loess slopes under earthquake action .....	ZHANG Xingchen, LIANG Qingguo, SUN Wen, CAO Xiaoping (1090)
Dynamic response characteristics and seismic fortification of structures in ground fissure site .....	YANG Xingkai, DENG Yahong, CHANG Jiang, MU Huandong, CAO Ge, NIU Dexin (1100)
Topographic effect of ridge terrains based on strong motion observation data .....	ZHOU Gangsheng, ZHOU You, ZHOU Zhenghua, WEI Lai, WEI Xin, SHEN Xinru, CHEN Zhen (1110)
Activity of the Xianghe—Huangzhuang fault in the northern margin of the North China Basin since the Late Pleistocene .....	PAN Zhilong, ZHANG Huan, WANG Hui, LI Qingzhe, BU Ling, SHI Guangyao, ZHANG Jinlong (1117)
Preliminary analysis of the seismogenic structure and full moment tensor inversion of the $M_{S}5.8$ Delingha, Qinghai earthquake on January 23, 2022 .....	XU Zhiguo, SHI Jianyu, LIANG Shanshan, LI Hongwei, ZOU Liye (1128)
Focal mechanism solution of Guyuan, Ningxia $M_{S}4.6$ earthquake in 2017 determined by three methods .....	XU Yingcai, GUO Xiangyun, ZENG Xianwei (1136)
Parameter determination of intensity envelope function based on the <i>code for seismic design of buildings</i> .....	YU Wenzheng, WU Zongqian, YANG Ruixin, LAN Xiang (1151)
Empirical estimation of $v_{S30}$ in Xiongan New Area .....	ZHANG Xiao, ZHANG He, LIU Siyu, LIU Shufeng (1160)

- Automatic recognition of natural earthquakes and artificial blasting based on the sample entropy of the Mel frequency cepstrum coefficient and support vector machine optimized by gray wolf optimization .....  
..... PANG Cong, JIANG Yong, LIAO Chengwang, WU Tao, DING Wei (1169)
- Preliminary study on deep-well geoelectrical resistivity sounding at Tongzhou station .....  
..... CUI Bowen, WANG Tongli, LI Ran, HU Yitao, WANG Lihong, LI Juzhen (1176)
- Match and locate for small event detection of the Yingjiang  $M_s$ 5.8 earthquake on March 10, 2011 , and investigation of its seismogenic mechanism .....  
..... WANG Xiao, ZHOU Zhengui, YE Qing, HUANG Jingguo, WANG Yalu, YU Dan, WANG Jun (1185)
- Time-frequency response characteristics for the typical deformation interference in Xiaomiao station based on wavelet decomposition and the synchrosqueezing transform .....  
..... YANG Zhipeng, CHEN Xiuqing, YU Yangyang, ZHANG Yuyang, (1192)  
WU Mengfei, XU Jianming, ZHAO Jing, ZHANG Zhengwei
- Hydrogen concentration in soil gas along the southern Tangyin graben, Henan Province, and associated relation with tectonic activities .....  
..... HU Ning, LOU Luling, MA Zhimin, WANG Mingliang, (1207)  
ZHANG Baoshan, WANG Yu, CHEN Meng, GUO Deke
- Comprehensive geophysical exploration for buried active faults in the Bailong River Basin .....  
..... XIE Xinglong, WANG Gaofeng, LI Qiuchen, NIU Xue, YE Zhennan, MA Xuemei (1216)
- Space-time symmetry of  $M_s \geq 6.8$  earthquakes in Iran from 1890 to 2020 and future earthquake situation .....  
..... YANG Funing, YAN Junping, WANG Ting, XIAO Nan, ZHU Chunming (1225)
- Classification and recognition algorithm for earthquake events based on the improved EWT and LogitBoost ensemble classifier .....  
..... MENG Juan, ZHANG Jiasheng, LI Ya'nan (1233)
- Space-time symmetry and tendency prediction of  $M_s \geq 7.1$  earthquakes in the Iranian Plateau and its surrounding areas .....  
..... WANG Xiaozhi, YAN Junping, DONG Zhibao (1243)