

<http://www.jrse.cn>

ISSN 1672-7029

CN43-1423/U

铁道科学与工程学报

# 铁道科学与工程学报

Journal of Railway Science and Engineering

November 2017

Volume 14 Number 11



中南大学  
中国铁道学会 主办

# 铁道科学与工程学报

2017 年 11 月

第 14 卷第 11 期

总第 92 期

## 目 次

### 高速铁路技术

- 高速铁路列车径路的分类及特征.....胡心磊, 史峰(2267)
- 高速列车头车主型线变化对列车周围流场影响研究.....何侃, 侯亚捷, 高广军, 张洁, 谢菲, 张琰, 张亚妮(2273)
- 盾构隧道下穿高速铁路的安全因素分析及应用.....钱王苹, 漆泰岳, 乐弋舟, 赵云建(2282)
- 列车竖向荷载与 CA 砂浆离缝对 CRTS II 型板式轨道开裂的影响分析.....孙旭, 高阳, 赵维刚, 杜彦良(2290)
- 高速铁路无砟轨道路基动应力频谱特性研究.....王启云, 张丙强, 赵卫华, 陈军浩(2299)

### 轨道与基础

- 制动荷载作用下桥上无砟轨道动力响应分析.....潘鹏, 雷晓燕, 张鹏飞, 吴神花, 桂昊(2309)
- 简支梁桥上 I 型板式无砟轨道制动力与位移分析.....张鹏飞, 桂昊, 高亮, 雷晓燕, 潘鹏(2323)
- 客货共线无砟轨道扣件垂向力现场测试与分析.....徐家铎, 任娟娟, 闫亚飞, 凤翔, 邓世杰(2333)
- 无砟轨道膨胀土地基的泥岩膨胀变形试验.....崔晓宁, 王起才, 张戎令, 王冲, 薛彦瑾(2339)
- 优化 GM(1,1)与 SVM 组合模型的路基冻胀预测应用.....乐天晗, 吴永军, 吴湘华, 陈峰(2345)
- 基于 VBA 的轨道结构三维数字化建模方法研究.....韩峰, 袁峰, 康峰(2352)
- 基于 FLAC<sup>3D</sup> 路基边坡安全系数影响因素分析.....姜恒超(2358)

## 桥梁隧道与结构

- 轨道交通槽形梁局部振动及参数敏感性分析.....刘林芽, 秦佳良, 曾峰(2363)  
装配式预应力混凝土 T 梁极限承载力试验研究.....王城泉, 申永刚, 杨润芳, 邹昀(2369)  
广东省改进综合单位线法洪峰流量计算方法研究.....李整, 陈代海, 刘琼(2377)  
非对称外倾式钢拱桥原位拼装施工定位技术.....朱仕耀, 颜全胜, 贾布裕, 余晓琳, 杨铮(2384)  
2 段式预制拼装预应力混凝土桥墩的抗震性能.....葛继平, 闫兴非, 王志强(2390)  
铁路隧道下穿连续刚构桥墩施工影响及防控措施研究.....王国栋, 王志杰, 段明明, 李昭(2399)  
穿越富水断层深埋引水隧洞涌水量预测研究.....朱彬彬, 董道军, 吴立, 吴义, 郝勇(2407)  
基于渣土改良的土压平衡盾构掘进参数特征研究.....肖超, 谭立新, 夏一夫, 吉回照, 阳军生, 黎永索(2418)  
落锤冲击下混凝土圆柱体动力效应数值模拟.....孟一, 黄方林(2427)

## 机车车辆与设备

- 轨道车辆大吨位组合式承载结构测力墙设计方法.....许平, 张德洪, 邵恒, 姚曙光(2435)  
受电弓与接触网动态仿真模型建立及其确认.....关金发, 吴积钦(2444)  
铁路扣件缺陷自动检测研究进展.....代先星, 阳恩慧, WANG Kelvin Chenping, 邱延峻, LI Joshua Qiang(2452)  
南昌地铁车辆动力学性能研究.....雷晓燕, 汪振国, 罗锟(2460)  
无人机危险品集装箱堆场巡查路径优化研究.....傅正堂, 胡志华, 费海平(2467)

## 运输·物流·工程管理

- 基于票价率偏差最小化的地铁分区票价优化方法.....邓连波, 杨翊, 高勋, 刘国欢(2473)  
基于小波灰色 GM(1,1)模型的货运量预测研究.....崔乃丹, 向万里, 孟学雷, 张春民, 张博昊(2480)  
基于多面体不确定性需求的鲁棒枢纽选址研究.....熊孝娟, 张李浩, 林国龙(2487)  
快递企业竞争力分析与评价.....何卫, 夏伟怀(2495)  
私家小客车合乘与停车一体化理念及模型构建.....王佳, 努尔飞叶·吐鲁洪(2503)

责任编辑：蒋学东 英文编审：肖源杰 封面设计：刘 谊

期刊基本参数：CN43-1423/U\*2004\*m\*A4\*242\*zh\*P\*¥20.00\*1500\*31\*2017-11

# Journal of Railway Science and Engineering

Volume 14 Number 11

(Sum 92)

November 2017

## CONTENTS

### High-speed Rail Technology

- Classification and characteristics of high-speed train paths..... HU Xinlei, SHI Feng(2267)  
Research on flow field around high-speed trains affected by varying major molded lines of head car  
..... HE Kan, HOU Yajie, GAO Guangjun, ZHANG Jie, XIE Fei, ZHANG Yan, ZHANG Yani(2273)  
The analysis and application of safety factors of shield-underneath high-speed railway  
..... QIAN Wangping, QI Taiyue, LE Yizhou, ZHAO Yunjian(2282)  
The study of influence on CRTS II slab track cracking caused by the vertical load of train and CA mortar void  
..... SUN Xu, GAO Yang, ZHAO Weigang, DU Yanliang(2290)  
Research on dynamic stress frequency spectrum of ballastless track subgrade of high speed railway  
..... WANG Qiyun, ZHANG Bingqiang, ZHAO Weihua, CHEN Junhao(2299)

### Track and Foundation

- Dynamic response analysis of ballastless track on bridge under braking load  
..... PAN Peng, LEI Xiaoyan, ZHANG Pengfei, WU Shenhua, GUI Hao(2309)  
Analysis of braking force and displacement for CRTS I slab ballastless track on simply supported bridge  
..... ZHANG Pengfei, GUI Hao, GAO Liang, LEI Xiaoyan, PAN Peng(2323)  
Field test and analysis of vertical force of fastener for slab track with passenger and freight traffic  
..... XU Jiaduo, REN Juanjuan, YAN Yafei, FENG Xiang, DENG Shijie(2333)  
Expansive deformation test on ballastless track of expansive mudstone  
..... CUI Xiaoning, WANG Qicai, ZHANG Rongling, WANG Chong, XUE Yanjin(2339)  
The forecast application of subgrade's frost-heaving index based on optimized GM(1,1) and SVM combination model  
..... LE Tianhan, WU Yongjun, WU Xianghua, CHEN Feng(2345)  
Study on 3D digital modeling of track structure based on VBA..... HAN Feng, YUAN Feng, KANG Feng(2352)  
Analysis of influencing factors of subgrade slope safety factor based on FLAC<sup>3D</sup>..... JIANG Hengchao(2358)

## **Bridge, Tunnel and Structure**

- Research on local vibration and parameter sensitivity analysis of rail transit trough beam ..... LIU Linya, QIN Jialiang, ZENG Feng(2363)
- Experimental study on failure mechanism of prestressed concrete T girder ..... WANG Chengquan, SHEN Yonggang, YANG Runfang, ZOU Yun(2369)
- Research on flow calculation method of improved synthetic unit hydrograph of Guangdong ..... LI Zheng, CHEN Daihai, LIU Qiong(2377)
- In-situ assembling construction orientation technologies for extroversive and unsymmetrical steel arch bridges ..... ZHU Shiyao, YAN Quansheng, JIA Buyu, YU Xiaolin, YANG Zheng(2384)
- Seismic performance analysis of two-segment bridge columns with prestressing bars ..... GE Jiping, YAN Xingfei, WANG Zhiqiang(2390)
- Research on the construction influence and protection of railway tunnel crossing beneath the pier of existing continuous rigid frame bridge ..... WANG Guodong, WANG Zhijie, DUAN Mingming, LI Zhao(2399)
- On the prediction of water inflow in deep buried diversiontunnel through water-rich fault ..... ZHU Binbin, DONG Daojun, WU Li, WU Yi, HAO Yong(2407)
- Excavation parameters characteristics of earth pressure balanced shield based on soil modification ..... XIAO Chao, TAN Lixin, XIA Yihu, JI Huizhao, YANG Junsheng, LI Yongsuo(2418)
- Numerical simulation study on dynamic behavior of concrete cylinder under drop hammer impact loading ..... MENG Yi, HUANG Fanglin(2427)

## **Vehicles and Equipment**

- Design method of large-tonnage load cell wall with composite support structure for rail vehicles ..... XU Ping, ZHANG Dehong, SHAO Heng, YAO Shuguang(2435)
- Building and confirmation for dynamic simulation model of pantograph and catenary ..... GUAN Jinfa, WU Jiqin(2444)
- Technology progress of automatic railway fastener inspection ..... DAI Xianxing, YANG Enhui, WANG Kelvin Chenping, QIU Yanjun, LI Joshua Qiang(2452)
- Research on dynamic performance of nanchang metro vehicle ..... LEI Xiaoyan, WANG Zhenguo, LUO Kun(2460)
- Hazardous container yard patrol optimization research with UAVS ..... FU Zhengtang, HU Zhihua, FEI Haiping(2467)

## **Transportation · Logistics · Engineering Management**

- Metro zonal fare optimization based on the minimum of fare rate deviation ..... DENG Lianbo, YANG Yi, GAO Xun, LIU Guohuan(2473)
- Railway freight volume forecasting based on grey GM(1,1) model and wavelet de-noising ..... CUI Naidan, XIANG Wanli, MENG Xuelei, ZHANG Chunmin, ZHANG Bohao(2480)
- Robust hub location based on demand with polyhedral uncertainty ..... XIONG Xiaojuan, ZHANG Lihao, LIN Guolong(2487)
- Analysis and evaluation of the competitiveness of express company ..... HE Wei, XIA Weihuai(2495)
- Private car carpooling and parking Integration concept and model construction ..... WANG Jia, Nuerfeiye Tuluhong(2503)