

# 目 次

**卷首语:** 努力做新时代轨道交通装备技术发展的新智源..... 贾利民  
**首届“田心论坛”特别报道**..... (前插页)

## 专稿

下一代高速列车关键技术的发展趋势和展望..... 张卫华, 缪炳荣 (1)  
 城市轨道交通全自动驾驶技术发展综述..... 路向阳, 李 雷, 雷成健, 马伟杰, 周开成 (6)  
 IEC/TS 62580-2 车载视频监视系统国际标准解析..... 刘 贵, 周桂法, 谢 喆, 王秋华 (13)

## 可靠性技术

变流器常用电连接器接触性能及可靠性分析..... 梁志伟, 陈南波 (17)  
 地铁信号系统可靠性评估解析方法研究..... 莫志刚, 骆汉宾 (22)  
 基于应力-强度模型的DTECS-2设备可靠度评估..... 胡平贵, 王 鹏 (27)

## 研究开发

一种基于最小二乘法的加速度估计方法..... 李江红, 胡照文, 陈华国, 张 宇 (30)  
 新型牵引供电系统中 MMC 变流器环流无源抑制策略  
 ..... 宋平岗, 董 辉, 周振邦, 吴继珍, 孙楠楠 (33)  
 用于永磁同步电机单电流弱磁控制的积分型滑模控制器..... 曹 玉, 迟 颂 (39)  
 基于循环变量法重载列车纵向力仿真分析..... 赵心迪, 郭其一, 吕 杰, 王梦超 (44)  
 JZ-8型机车制动控制系统研制..... 王其伟, 许丰磊, 刘 澳, 李 莉, 王令军 (48)  
 高速动车组圆柱滚子轴承的应用研究..... 李国栋, 赵文学, 韩庆利 (54)  
 基于组合型随机零矢量 PWM 控制器研究..... 张广远, 吴志友, 姜 涛 (57)  
 基于 ADAMS 的列车弓网动力学性能研究..... 刘 楠 (62)  
 铁路信号继电器二次吸合机理分析及参数测量计算..... 李文华, 郑 杭, 王立国, 周露露 (68)  
 大修列车龙门吊设计及静强度分析..... 刘铁军, 陈新华 (73)

## 城市轨道交通车辆

城轨列车铰接式转向架转盘轴承的设计..... 王高峰, 王艳平, 李光辉, 张亚平, 张少龙 (77)  
 储能式无轨电车 DC/DC 非线性控制策略的研究..... 王俊然, 张昆仑, 黄 庆, 徐绍龙 (80)  
 地铁转向架摇枕抗疲劳设计方法研究..... 孙晖东, 高晓霞, 高 峰, 李志永 (84)  
 某型城际动车组接地技术方案设计和试验验证..... 陈乐恒, 李东波, 刘雁翔 (88)  
 城市轨道交通运行中的车钩力最优控制策略..... 荆飞瑶, 徐 刚, 尹 健, 沈剑豪 (94)  
 地铁抗侧滚扭杆关节轴承产生异响的分析及改进措施..... 江现昌, 王云峰, 罗宗渝 (100)

## 试验检测

基于交流传动试验平台的智能试验设计..... 姬志远, 程 浩, 刘护林, 高连升 (103)  
 大型养路机械状态监测及故障诊断系统..... 卢云波, 张 雷 (108)

## 运用维保

和谐系列机车 LKJ 输出常用制动后不缓解原因分析及措施..... 马 骏 (111)  
 HXD2B 型电力机车充电机故障分析及建议..... 丁福建 (114)  
 城轨车辆供风系统电控模块故障分析与优化..... 王烟平, 周蓼华 (117)  
 压缩空气不洁引起的制动系统压力控制异常分析及改进..... 王小明, 周子舟 (119)  
 HXD1 型电力机车避雷器炸损故障与分析..... 茹锡勇, 彭 赞, 郭小华, 吴 军 (122)

## 动态消息

中车株洲所一项发明专利荣获“中国专利金奖” (16)      《机车电传动》 编辑部声明 (113)  
 欢迎订阅《机车电传动》 (116)      广告索引 (125)

期刊基本参数: CN 43-1125/U\*1960\*b\*A4\*125\*zh\*P\* ¥15.00\* \*29\*2018-01  
 封面照片: 宁波轨道交通 3 号线首列车



### Sponsored by

CRRC Zhuzhou Institute  
Co., Ltd.

### Editor-in-chief

DING Rongjun

### Printed by

Zhuzhou KeFa Printing Industry Co.,  
Ltd., Zhuzhou, Hunan, China

### China Standard Serial Numbering

ISSN 1000-128X

CN 43-1125/U

### Distributed by

Zhuzhou Municipal Post Office

### Domestic Subscription Office

Post Offices all over China

### Overseas Distributor

China International Book Trading  
Corporation (P.O. Box 399, Beijing, China)

### Foreign Service Distribution Code

BM353

### Address

Editorial Department of *ELECTRIC DRIVE  
FOR LOCOMOTIVES*, CRRC Zhuzhou  
Institute Co., Ltd., Hunan 412001, China

Tel (86-731)28498221, 28498141

Fax (86-731)28498141

E-mail edl@csrzc.com

http://edl.crrzic.cc

http://JCDC.chinajournal.net.cn

http://jcdcd.periodicals.net.cn

### Special Report

- Development Trend and Prospect of Key Technologies for Next Generation High Speed Trains  
.....ZHANG Weihua, MIAO Bingrong ( 1 )
- A Review of the Development of Urban Railway Transport Full Automatic Operation  
Technology .....LU Xiangyang, LI Lei, LEI Chengjian, MA Weijie, ZHOU Kaicheng ( 6 )
- Analysis of International Standard IEC/TS 62580-2 for On-board Video Surveillance System  
.....LIU Gui, ZHOU Guifa, XIE Zhe, WANG Qiuhua ( 13 )

### Reliability Engineering

- Contact Performance and Reliability Analysis of Commonly Used Connectors Applied  
in Converter System.....LIANG Zhiwei, CHEN Nanbo ( 17 )
- Research on Reliability Evaluation Method of Metro Signal System  
.....MO Zhigang, LUO Hanbin ( 22 )
- DTECS-2's Reliability Assessment Based on Stress-intensity Model  
.....HU Pinggui, WANG Peng ( 27 )

### Research & Development

- A Novel Acceleration Estimation Algorithm Based on Least Square Method  
.....LI Jianghong, HU Zhaowen, CHEN Huaguo, ZHANG Yu ( 30 )
- Passive Circulation Suppression Strategy of MMC Converter in New TPSS  
.....SONG Pinggang, DONG Hui, ZHOU Zhenbang, WU Jizhen, SUN Nannan ( 33 )
- Integral Sliding Mode Controller for PMSM Single Current Flux-Weakening Control  
.....CAO Yu, CHI Song ( 39 )
- Longitudinal Force Simulation for Heavy Haul Train Based on Cycle Variable Method  
.....ZHAO Xindi, GUO Qiyi, LYU Jie, WANG Mengchao ( 44 )
- Development of JZ-8 Brake Control System for Locomotive  
.....WANG Qiwei, XU Fenglei, LIU Ao, LI Li, WANG Lingjun ( 48 )
- Application Development of Cylindrical Roller Bearing for High-speed EMUs  
.....LI Guodong, ZHAO Wenxue, HAN Qingli ( 54 )
- Research on Combination of Random Zero-Vector PWM Controller  
.....ZHANG Guangyuan, WU Zhiyou, JIANG Tao ( 57 )
- Study of Vehicle Pantograph-catenary Dynamic Performance Based on ADAMS  
.....LIU Nan ( 62 )
- Mechanism Analysis and Parameter Calculation of Second Time Close for Railway  
Signal Relay.....LI Wenhua, ZHENG Hang, WANG Liguo, ZHOU Lulu ( 68 )
- Design and Static Strength Analysis of Overhaul Train Gantry Crane  
.....LIU Tiejun, CHEN Xinhua ( 73 )

### Urban Rail & Vehicle

- Slewing Bearing Design of Articulated Bogie for Urban Rail Vehicles  
.....WANG Gaofeng, WANG Yanping, LI Guanghui, ZHANG Yaping, ZHANG Shaolong ( 77 )
- Research on No-linear DC/DC Control Strategy for Energy Storage Trolley Bus  
.....WANG Junran, ZHANG Kunlun, HUANG Qing, XU Shaolong ( 80 )
- Research on Anti-fatigue Technology for Metro Bogie Bolster  
.....SUN Huidong, GAO Xiaoxia, GAO Feng, LI Zhiyong ( 84 )
- Designing and Testing of the Grounding Technology Solution within an Intercity EMUs  
.....CHEN Leheng, LI Dongbo, LIU Yanxiang ( 88 )
- Optimal Control Strategy of Coupler Force in Urban Rail Transit  
.....JING Feiyao, XU Gang, YIN Jian, SHEN Jianhao ( 94 )
- Abnormal Noise Analysis and Improving Measures of Anti-roll Torsion Bar Bearing for  
Metro Vehicle.....JIANG Xianchang, WANG Yunfeng, LUO Zongyu ( 100 )

### Test & Detection

- Intelligent Test Design Based on AC-drive Test Platform  
.....JI Zhiyuan, CHENG Hao, LIU Hulin, GAO Liansheng ( 103 )
- Large Maintenance Machinery State Monitoring and Fault Diagnosis System  
.....LU Yunbo, ZHANG Lei ( 108 )

### Operation & Maintenance

- Cause Analysis and Measures of No-release Fault after LKJ Output Common Brake for  
Harmonic Locomotive.....MA Jun ( 111 )
- Fault Analysis and Suggestions for HXd2B Locomotive Charger.....DING Fujian ( 114 )
- Fault Analysis and Optimization of Air Supply System Electric Control Modularity for Metro  
Vehicle.....WANG Yanping, ZHOU Liaohua ( 117 )
- Abnormal Analysis and Improvement of Brake System Pressure Control Caused by Unclean  
Compressed Air.....WANG Xiaoming, ZHOU Zizhou ( 119 )
- Arrester Broken Fault Analysis of HXd1 Locomotive  
.....RU Xiyong, PENG Yun, GUO Xiaohua, WU Jun ( 122 )