



ISSN 1000-6753

CN 11-2188/TM

半月刊

SEMIMONTHLY

# 电工技术学报

TRANSACTIONS OF  
CHINA ELECTROTECHNICAL SOCIETY



中国电工技术学会主办

2022年 第10期

第37卷 Vol. 37 No. 10

ISSN 1000-6753



9 771000 675222

# 电工技术学报

第 37 卷 第 10 期 (2022 年 5 月 25 日出版)

## 目 次

### 电工理论

- 2399 水下具有旋转耦合机构的电场耦合无线电能传输系统及参数优化方法  
..... 苏玉刚 钱林俊 刘 哲 邓仁为 孙 跃
- 2411 轨道交通 350kW 大功率无线电能传输系统研究.....陈凯楠 蒋 焯 檀 添 林秋琼 李剑超等
- 2422 基于 LCL-LCL/S 混合自切换谐振式无线充电系统.....郭 星 刘利强 齐咏生 高学金 李永亨

### 电机及其系统

- 2435 考虑互感的多齿开关磁链永磁记忆电机的精确磁路模型.....沈月芬 刘 旭
- 2446 高模数电磁力对永磁电机电磁振动影响.....洪剑锋 王善铭 孙宇光 孙旭东 曹海翔
- 2459 基于周期谐波扩频调制的永磁同步电机高频边带声振抑制.....邱子楨 陈 勇 成海全 刘 旭 谷丰收
- 2469 超高速永磁电机驱动系统电流环稳定性分析与改进设计.....鲍旭聪 王晓琳 顾 聪 石滕瑞
- 2481 高霍尔位置检测精度的圆筒型永磁同步直线电机设计.....张春雷 张 辉 叶佩青
- 2491 中速磁悬浮列车分段式长定子永磁直线同步电机牵引控制策略.....赵牧天 葛琼璇 朱进权 王晓新 王 珂
- 2503 基于扩展滑模扰动观测器的永磁直线同步电机定结构滑模位置跟踪控制.....武志涛 李 帅 程万胜
- 2513 全闭环伺服驱动系统位置控制通信延时补偿技术.....倪启南 杨 明 李云嵩 徐殿国

### 电力电子

- 2523 基于开关轨迹优化的 SiC MOSFET 有源驱动电路研究综述.....王 宁 张建忠
- 2538 SiC MOSFET 短路保护技术综述.....文 阳 杨 媛 宁红英 张 瑜 高 勇
- 2549 基于 MOSFET 的串联谐振双有源桥死区振荡机理分析及抑制.....胡钰杰 李子欣 赵 聪 罗 龙 李耀华
- 2559 结合电流应力优化与虚拟电压补偿的双有源桥 DC-DC 变换器三重移相优化控制  
..... 蔡逢煌 石安邦 江加辉 王 武 林琼斌
- 2572 四开关 Buck-Boost 变换器的多模式模型预测控制策略.....吴 岩 王 玮 曾国宏 吴学智 唐 芬
- 2584 基于序阻抗的虚拟同步机同步频率谐振现象.....于彦雪 关万琳 陈晓光 李浩昱
- 2596 逆变型分布式电源并网运行暂态稳定机理与评估方法.....余墨多 黄文焘 邵能灵 马洲俊 林亚阳
- 2611 无通信高电能质量的微电网平滑切换控制策略.....郭慧珠 孟 鑫 贺明智 刘雪山 刘进军
- 2622 基于辅助绕组的高频变压器绕组损耗测量方法.....汪 涛 骆仁松 文继峰 张茂强 田 杰

### 智能电器

- 2631 电磁开关高频吸持噪声抑制策略.....汤龙飞 庄剑雄 孙怀懿 许志红
- 2644 考虑气动系统的高速受电弓分层控制.....杨 鹏 张 静 金 伟 刘志刚
- 2656 基于波形匹配端点延拓法优化的经验模态分解算法在铁路继电器参数降噪上的应用  
..... 李文华 姜 惠 赵正元 潘如政 胡康生

# TRANSACTIONS OF CHINA ELECTROTECHNICAL SOCIETY

Vol.37 No.10 (May 25 2022)

## Contents

- 2399 Underwater Electric-Filed Coupled Wireless Power Transfer System with Rotary Coupler and Parameter Optimization Method  
..... Su Yugang Qian Linjun Liu Zhe Deng Renwei Sun Yue
- 2411 Research on 350kW High Power Wireless Power Transfer System for Rail Transit  
..... Chen Kainan Jiang Ye Tan Tian Lin Qiuqiong Li Jianchao et al
- 2422 Hybrid Self-Switching Resonant Wireless Charging System Based on LCL-LCL/S  
..... Guo Xing Liu Liqiang Qi Yongsheng Gao Xuejin Li Yongting
- 2435 Accurate Magnetic Circuit Model of Multi-Tooth Switched Flux Permanent Magnet Memory Machine Considering  
the Mutual Inductance ..... Shen Yuefen Liu Xu
- 2446 The Influence of High-Order Force on Electromagnetic Vibration of Permanent Magnet Synchronous Motors  
..... Hong Jianfeng Wang Shanming Sun Yuguang Sun Xudong Cao Haixiang
- 2459 Periodic Harmonic Spread Spectrum Modulation for High-Frequency Sideband Vibro-Acoustic Suppression in  
Permanent Magnet Synchronous Motor..... Qiu Zizhen Chen Yong Cheng Haiquan Liu Xu Gu Fengshou
- 2469 Stability Analysis and Improvement Design of Current Loop of Ultra-High-Speed Permanent Magnet Motor Drive System  
..... Bao Xucong Wang Xiaolin Gu Cong Shi Tengrui
- 2481 Design of Tubular Permanent Magnet Synchronous Linear Motor by Reliability-Based Robust Design Optimization  
..... Zhang Chunlei Zhang Hui Ye Peiqing
- 2491 Traction Control Strategy of Segmented Long Stator Permanent Magnet Linear Synchronous Motor for  
Medium-Speed Maglev Train ..... Zhao Mutian Ge Qiongxuan Zhu Jinquan Wang Xiaoxin Wang Ke
- 2503 Fixed Structure Sliding Mode Position Tracking Control for Permanent Magnet Linear Synchronous Motor Based on  
Extended Sliding Mode Disturbance Observer ..... Wu Zhitao Li Shuai Cheng Wansheng
- 2513 Communication Delay Compensation Technology of Full-Closed Loop Position Control for Servo Drive System  
..... Ni Qinan Yang Ming Li Yunsong Xu Dianguo
- 2523 Review of Active Gate Driver for SiC MOSFET with Switching Trajectory Optimization..... Wang Ning Zhang Jianzhong
- 2538 Review on Short-Circuit Protection Technology of SiC MOSFET  
..... Wen Yang Yang Yuan Ning Hongying Zhang Yu Gao Yong
- 2549 Mechanism Analysis and Suppression of Oscillation in Dead Time of Series Resonant Dual Active Bridge Based on MOSFET  
..... Hu Yujie Li Zixin Zhao Cong Luo Long Li Yaohua
- 2559 Triple-Phase-Shift Optimal Control of Dual-Active-Brige DC-DC Converter with Current Stress Optimization and  
Virtual Voltage Compensation..... Cai Fenghuang Shi Anbang Jiang Jiahui Wang Wu Lin Qiongbn
- 2572 Multi-Mode Model Predictive Control Strategy for the Four-Switch Buck-Boost Converter  
..... Wu Yan Wang Wei Zeng Guohong Wu Xuezhi Tang Fen
- 2584 Synchronous Frequency Resonance in Virtual Synchronous Generator Based on Sequence-Impedance  
..... Yu Yanxue Guan Wanlin Chen Xiaoguang Li Haoyu
- 2596 Transient Stability Mechanism and Judgment for Inverter Interfaced Distributed Generators Connected with Public Grids  
..... Yu Moduo Huang Wentao Tai Nengling Ma Zhoujun Lin Yayang
- 2611 An Enhanced Power Quality and Smooth Transition Control Strategy for a Microgrid without  
Remote Pre-Synchronization Communication ..... Guo Huizhu Meng Xin He Mingzhi Liu Xueshan Liu Jinjun
- 2622 A Measurement Method of Winding Loss for High-Frequency Transformer Based on Auxiliary Winding  
..... Wang Tao Luo Rensong Wen Jifeng Zhang Maoqiang Tian Jie
- 2631 Suppression Strategies of Electromagnetic Switch High-Frequency Holding Noise  
..... Tang Longfei Zhuang Jianxiong Sun Huaiyi Xu Zhihong
- 2644 Hierarchical Control of High-Speed Pantograph Considering Pneumatic System ..... Yang Peng Zhang Jing Jin Wei Liu Zhigang
- 2656 Application of Empirical Mode Decomposition Algorithm Based on Waveform Matching Endpoint Continuation Method in  
Noise Reduction of Railway Relay Parameters..... Li Wenhua Jiang Hui Zhao Zhengyuan Pan Ruzheng Hu Kangsheng