



中国电机工程学报

ZHONGGUO DIANJI GONGCHENG XUEBAO

第 42 卷

第 17 期 (总第 700 期)

2022 年 9 月 5 日

目 次

(论文电子版 <http://www.pcsee.org/CN/volumn/home.shtml>)

· 支撑碳达峰、碳中和的能源电力关键技术 ·

基于可逆固体氧化物电池的氢电一体化能源站容量规划 高赐威, 王威, 陈涛 (6155)
计及双向耦合的气-电综合能源系统全动态多速率联合仿真算法研究

..... 欧阳自强, 韩鹏飞, 严正, 徐潇源, 韩冬 (6170)

大型海港综合能源系统物流-能量协同优化调度方法 黄逸文, 黄文焘, 卫卫, 邵能灵, 李然 (6184)

零能耗建筑电-氢-热双层能量优化调控方法 孔令国, 王士博, 蔡国伟, 刘闯, 郭小强 (6196)

面向电池梯次利用筛选需求的定制化聚类优化方法 马速良, 李建林, 李雅欣, 陈明轩, 张宝平 (6208)

· 智能电网 ·

基于变分不等式理论的电力-交通耦合网络均衡状态研究 谢仕炜, 林伟伟, 张亚超 (6220)

考虑不确定性的辐射网静态电压稳定极限的二阶锥优化算法 陈昌, 万凯遥, 姜彤 (6239)

考虑天然气管网多状态模型的电-气综合能源系统可靠性评估 李宏仲, 孔振宇, 陶淳逸 (6247)

图数据建模与图表示学习方法及其非侵入式负荷监测问题的应用

..... 彭秉刚, 潘振宁, 余涛, 邱磊鑫, 苏晓, 陈镇煌 (6260)

基于可视化轨迹圆和 ResNet18 的复合电能质量扰动类型识别 兰名扬, 刘宇龙, 金涛, 龚正, 刘梓强 (6274)

一种基于复合 AI 模型的动态阈值设定方法 张立中, 谭源, 王莹, 陈志刚 (6286)

· 可再生能源并网技术 ·

应用于新能源发电设备阻抗测量的扰动信号类型综述 李萌, 年珩, 胡彬, 徐韵扬, 廖玉茗, 杨军, 刘一鸣 (6296)

考虑氢负荷的新型电力系统电源规划 袁铁江, 孙传帅, 谭捷, 王进君 (6316)

直驱风电场经柔直并网的虚拟并联阻抗次同步振荡抑制策略 李云丰, 赵文广, 孔明, 周啸, 许杰锋 (6326)

锁相环同步型变流器并联系统暂态同步稳定分析 易相彤, 黄文, 沈超, 彭也伦, 帅智康 (6338)

· 发电 ·

光伏发电伺服系统数字动态面智能控制策略 祝国强, 朱琳非, 张叶, 王顺江, 张秀宇, 孙灵芳 (6347)

电站间接空冷散热器管束防冻预测模型及数值验证和实验研究

..... 王伟佳, 孔艳强, 温新宇, 李安生, 杨立军, 杜小泽 (6357)

裂纹倾斜角度对呼吸裂纹转子非线性刚度及动力学特性的影响

..... 张广辉, 国阳, 王维强, 赵御勃, 李豫, 刘占生 (6368)

梳齿密封阻旋栅有效性的定量分析与判别 张乃丹, 张万福, 吴可欣, 顾承璟, 杨兴辰, 李春 (6379)

H₂O 对 CaO 硫化反应加速作用机理研究 方远, 王春波, 陈亮, 戴文浩, 闫广精 (6389)

· 电力电子与电力传动 ·

并网逆变器的谐波放大机制与应用 侯川川, 朱淼, 刘纯, 何国庆, 汪海蛟 (6398)

一种有源中点钳位五电平逆变器简化等效空间矢量调制策略

..... 刘计龙, 李科峰, 肖飞, 麦志勤, 付康壮, 连传强 (6410)

基于误差电压精确计算的表贴式永磁同步电机逆变器非线性补偿方法

..... 龙江, 杨明, 陈扬洋, 刘铠源, 张军, 张杰, 徐殿国 (6425)

航空燃料电池用馈流式半桥 DC/DC 变换器预测优化控制研究

..... 赵冬冬, 李海言, 夏磊, 方淳, 马睿, 皇甫宜耿, 赵犇 (6436)

应用于贯通供电系统的两相-单相变换器直流电压纹波特性与功率均衡控制

..... 孟令辉, 周犹松, 闫晗, 楚锋, 舒泽亮 (6449)

· 电机与电器 ·

一种基于永磁同步电机绕组铜耗功率最大的电动汽车母线电容放电方法 张晓军, 杨家强, 杨昊林 (6460)

一种混合励磁的多功能饱和铁芯故障限流器 袁佳歆, 洪永贵, 张朝阳, 邹春航, 叶丛韬 (6471)

基于鲁棒观测器的变漏磁永磁电机无位置传感器控制研究 王其轩, 朱孝勇, 张丽, 徐磊, 张超 (6480)

不同极槽配合交替极永磁电机齿槽转矩和转矩脉动的研究 李烽, 王凯, 高培伟, 朱姝姝, 刘闯, 姜仁华 (6491)

· 高电压技术 ·

不同粗糙度界面和脱气处理对 500kV XLPE 直流电缆工厂接头的影响

..... 孟繁博, 陈向荣, 徐星, 张梦甜, 石逸雯, 丰如男, 何行波 (6499)

基于单光子探测的局部放电多光谱诊断方法研究 李信哲, 任明, 李琛, 陈荣发, 余家赫, 夏昌杰 (6511)

直流电压下 C₄F₇N/CO₂ 混合气体中环氧复合绝缘子表面电荷积聚特性

..... 董俊豪, 陈俊鸿, 李金殊, 李文栋, 刘健犇, 邓军波, 张冠军 (6521)

· 英文概述见论文电子版 ·

PROCEEDINGS OF THE CHINESE SOCIETY FOR
ELECTRICAL ENGINEERING
(PROCEEDINGS OF THE CSEE)

Vol.42 No.17 (Ser. 700)

Sep. 5, 2022

CONTENTS

(Electronic Journals <http://www.pcsee.org/EN/volumn/current.shtml>)

• **Key Technologies of Power and Energy Systems for Supporting Peak Carbon Dioxide Emissions and Carbon Neutrality** •

- Capacity Planning of Electric-hydrogen Integrated Energy Station Based on Reversible Solid Oxide Battery GAO Ciwei, WANG Wei, CHEN Tao (6155)
- Research on Complete Dynamic Multi-rate Co-simulation Algorithm of Integrated Electric-gas Energy System With Two-way Coupling OUYANG Ziqiang, HAN Pengfei, YAN Zheng, XU Xiaoyuan, HAN Dong (6170)
- Logistics-energy Collaborative Optimization Scheduling Method for Large Seaport Integrated Energy System HUANG Yiwen, HUANG Wentao, WEI Wei, TAI Nengling, LI Ran (6184)
- Zero Energy Building Electricity-hydrogen-heat Double-layer Energy Optimization Control Method KONG Lingguo, WANG Shibo, CAI Guowei, LIU Chuang, GUO Xiaoqiang (6196)
- Customized Clustering Optimization Method for Battery Reutilization Screening Requirements MA Suliang, LI Jianlin, LI Yaxin, CHEN Mingxuan, ZHANG Baoping (6208)

• **Smart Grid** •

- Research on Coupled Power-transportation Network Equilibrium State Based on Variational Inequality Theory XIE Shiwei, LIN Weiwei, ZHANG Yachao (6220)
- A Conic Optimization Method for Voltage Stability Assessment of Distribution Network Under Uncertainty CHEN Chang, WAN Kaiyao, JIANG Tong (6239)
- Reliability Evaluation of Electric-Gas Integrated Energy System Considering the Multi-state Model of Natural Gas Pipeline Network LI Hongzhong, KONG Zhenyu, TAO Chunyi (6247)
- Graph Data Modeling and Graph Representation Learning Methods and Their Application in Non-intrusive Load Monitoring Problem PENG Binggang, PAN Zhenning, YU Tao, QIU Leixin, SU Xiao, CHEN Zhenhuang (6260)
- An Improved Recognition Method Based on Visual Trajectory Circle and ResnetN18 for Complex Power Quality Disturbances LAN Mingyang, LIU Yulong, JIN Tao, GONG Zheng, LIU Ziqiang (6274)
- A Dynamic Threshold Setting Method Based on Composite AI Model ZHANG Lizhong, TAN Yuan, WANG Kun, CHEN Zhigang (6286)

• **Grid Integration of Renewable Energy Resources** •

- Review of Perturbation Signals Applied to Impedance Measurement of Renewable Generator LI Meng, NIAN Heng, HU Bin, XU Yunyang, LIAO Yuming, YANG Jun, LIU Yiming (6296)
- Generation Planning of New Power System Considering Hydrogen Load YUAN Tiejia, SUN Chuanshuai, TAN Jie, WANG Jinjun (6316)
- Virtual Paralleled-impedance Control Strategy of Flexible HVDC Connecting to the PMSG-based Wind Farm for Sub-synchronous Oscillation Suppression LI Yunfeng, ZHAO Wenguang, KONG Ming, ZHOU Xiao, XU Jiefeng (6326)
- Transient Synchronization Stability Analysis of Paralleled Converter Systems With Phase-locked Loop YI Xiangtong, HUANG Wen, SHEN Chao, PENG Yelun, SHUAI Zhikang (6338)

• **Power Generation** •

- Digital Dynamic Surface Intelligent Control Strategy of Photovoltaic Power Generation Servo System ZHU Guoqiang, ZHU Linfei, ZHANG Ye, WANG Shunjiang, ZHANG Xiuyu, SUN Lingfang (6347)
- Anti-freezing Predicting Models, Numerical Verification and Experimental Research for Air-cooled Heat Exchanger Tube Bundles of Natural Draft Dry Cooling System in Power Plant WANG Weijia, KONG Yanqiang, WEN Xinyu, LI Ansheng, YANG Lijun, DU Xiaoze (6357)
- Study on Nonlinear Stiffness and Dynamic Characteristics of Inclined Cracked Rotors With Different Crack Inclination Angles ZHANG Guanghui, GUO Yang, WANG Weiqiang, ZHAO Yubo, LI Yu, LIU Zhansheng (6368)
- Quantitative Analysis and Evaluation on the Effectiveness of Swirl Brakes for Labyrinth Seals ZHANG Naidan, ZHANG Wanfu, WU Kexin, GU Chengjing, YANG Xingchen, LI Chun (6379)
- Study on the Acceleration Mechanism of H₂O to CaO Sulfation FANG Yuan, WANG Chunbo, CHEN Liang, DAI Wenhao, YAN Guangjing (6389)

• **Power Electronics and Drives** •

- Harmonic Amplification Mechanism and Application of Grid-tied VSI HOU Chuanchuan, ZHU Miao, LIU Chun, HE Guoqing, WANG Haijiao (6398)
- A Simplified Equivalent SVPWM Strategy for Active Neutral Point Clamped Five-level Inverter LIU Jilong, LI Kefeng, XIAO Fei, MAI Zhiqin, FU Kangzhuang, LIAN Chuanqiang (6410)
- Inverter Nonlinearity Compensation Method for SPMSM Drives Based on Accurate Voltage Error Calculation LONG Jiang, YANG Ming, CHEN Yangyang, LIU Kaiyuan, ZHANG Jun, ZHANG Jie, XU Dianguo (6425)
- Research on Predictive Optimization Control of Current-fed Half-bridge DC/DC Converter for Aerospace Fuel Cells ZHAO Dongdong, LI Haiyan, XIA Lei, FANG Chun, MA Rui, HUANGFU Yigeng, ZHAO Ben (6436)
- DC-link Voltage Ripple Analysis and Power Balanced Control for Two-phase to Single-phase Converter in Advanced Traction Power Supply System MENG Linghui, ZHOU Yousong, YAN Han, CHU Feng, SHU Zeliang (6449)

• **Electric Machines and Apparatus** •

- A DC-bus Capacitor Discharge Method Based on Maximum Copper Consumption Power of Permanent Magnet Synchronous Motor Windings in Electric Vehicles ZHANG Xiaoju, YANG Jiaqiang, YANG Haolin (6460)
- A Multifunctional Saturated Core Fault Current Limiter With Hybrid Excitation YUAN Jiaxin, HONG Yonggui, ZHANG Zhaoyang, ZOU Chunhang, YE Congtao (6471)
- Research on Sensorless Control of a Variable Leakage Flux Permanent Magnet Synchronous Motor Based on Robust Estimator WANG Qixuan, ZHU Xiaoyong, ZHANG Li, XU Lei, ZHANG Chao (6480)
- Investigation of Cogging Torque and Torque Ripple in Consequent Pole Permanent Magnet Machine With Different Slot/Pole Number Combinations LI Feng, WANG Kai, GAO Peiwei, ZHU Shushu, LIU Chuang, JIANG Renhua (6491)

• **High Voltage Engineering** •

- Effect of Different Roughness Interface and Degassing Treatment on 500kV XLPE DC Cable Factory Joint MENG Fanbo, CHEN Xiangrong, XU Xing, ZHANG Mengtian, SHI Yiwen, FENG Runan, HE Xingbo (6499)
- Multispectral Partial Discharge Diagnosis Based on Single Photon Detection LI Xinzhe, REN Ming, LI Chen, CHEN Rongfa, YU Jiahe, XIA Changjie (6511)
- Surface Charge Accumulation Characteristics of Epoxy Composite Insulator in C₄F₇N/CO₂ Mixture Under DC Voltage DONG Junhao, CHEN Junhong, LI Jinshu, LI Wendong, LIU Jianben, DENG Junbo, ZHANG Guanjun (6521)

• **For Extended Summaries, Please See the Electronic Journals** •