

中国电机工程学报

半月刊

第 41 卷 第 20 期

Proceedings of the CSEE

SEMIMONTHLY

Vol.41 No.20



10月
2021
2021-10-20 出版

ISSN 0258-8013



9 770258 801216



中国电机工程学会主办
THE CHINESE SOCIETY FOR ELECTRICAL ENGINEERING



中国电机工程学报

ZHONGGUO DIANJI GONGCHENG XUEBAO

第 41 卷

第 20 期 (总第 679 期)

2021 年 10 月 20 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 ·

清洁供热模式下多能异构负荷调控框架及关键技术剖析 孙毅, 李泽坤, 鲍荟谕, 刘春蕾, 庞鹏飞 (6827)

· 大电网规划与运行 ·

电力系统惯量评估研究框架与展望 张武其, 文云峰, 迟方德, 王康, 李立 (6842)

考虑负荷柔性及网架调整的电-气联合调度模型 赵霞, 冯欣欣, 戴蓉, 王骆 (6856)

电力系统同步相量异常数据检测与修复研究现状与展望 徐飞阳, 薛安成, 常乃超, 孔贺, 徐劲松 (6869)

考虑需求响应的源网荷协调分布鲁棒长期扩展规划 陈保瑞, 刘天琪, 何川, 胡晓通, 苏学能 (6886)

锁相同步型风机-同步机互联电力系统转子转速尺度暂态同步稳定性分析

..... 唐王倩云, 周保荣, 胡家兵, 郭泽仁, 张睿 (6900)

基于临界割集识别的储能系统提高电网暂态稳定裕度的研究 李培强, 孙培栋, 李欣然, 赵伟, 雷二涛 (6916)

· 智能电网 ·

基于区块链的表后微网系统及其点对点能量块交易模型设计

..... 穆程刚, 丁涛, 曲明, 贺元康, 王永庆, 陈天恩 (6927)

基于风功率三参数幂律模型预测日前调频需求的调频辅助服务市场研究 郭钰锋, 潘梦琪 (6941)

含快速线路筛选的电力系统发输电协同优化运行 陆明璇, 周明, 黄瀚燕, 李庚银 (6949)

基于伏安特性动态轨迹的谐振接地系统弧光高阻接地故障检测方法 王宾, 崔鑫 (6959)

含高比例光伏配电网的高频阻抗差动保护

..... 晁晨翔, 郑晓冬, 高飘, 邵能灵, 涂崎, 孙天甲, 李卫彬, 安怡然 (6968)

基于无源滤波器设计理论的半波长输电线路调谐电路特性分析

..... 曹璞璘, 范浩然, 王登, 束洪春, 韩一鸣, 杨博, 董俊 (6979)

基于云图特征提取的改进混合神经网络超短期光伏功率预测方法

..... 余光正, 陆柳, 汤波, 王思源, 杨秀, 陈汝斯 (6989)

· 发电 ·

热力循环流程重构能效分析新方法: 循环拆分法 杨勇平, 辛团团, 许诚 (7003)

涡轮盘腔密封特性与流动机理研究进展 尹钊, 李耀阳, 张华良, 王嘉辉, 陈海生 (7014)

考虑燃料电池效率区间优化的混合动力系统双模式能量管理方法 甘锐, 李奇, 江淑娜, 孟翔, 陈维荣 (7027)

1000MW 超超临界燃煤机组汞排放特征

..... 张翼, 叶云云, 顾永正, 张青松, 史晓宏, 张帅, 王家伟, 汪涛, 张永生 (7039)

Wagner 型通用蒸汽压方程优化算法研究 尹建国, 可晋军, 赵贯甲, 马素霞 (7046)

· 电力电子与电力传动 ·

高性能电力电子设计自动化求解器关键因素与解决方法 袁立强, 陆子贤, 戴宇轩, 赵争鸣 (7055)

考虑芯片电热应力分布的 IGBT 动态雪崩工况电热联合仿真 马天兆, 罗毅飞, 贾英杰, 李鑫, 史泽南 (7068)

T 型三电平逆变器并联系统的故障容错控制方法 陈志远, 陈杰, 邢相洋, 李晓艳, 付有良, 张承慧 (7079)

换流变压器振动信号多层次特征提取模型研究 张占龙, 肖睿, 武雍烨, 蒋培榆, 邓军, 潘志城 (7093)

基于简化 SVM 的模块化多电平变换器多子模块故障容错运行策略 白志红, 李奕飞, 马皓 (7104)

· 电机与电器 ·

十二相同步发电机整流系统直流极间短路电流的解析计算方法 马凡, 付立军, 郭云珺, 易新强, 纪锋 (7117)

永磁同步电机电磁结构及磁场调节技术的综述分析 寇宝泉, 赵晓坤, 张浩泉, 王梦瑶 (7126)

基于虚拟直流母线结构的轴向磁场永磁电机小电容驱动系统 张超, 徐磊, 朱孝勇, 杜恽, 全力 (7141)

串联二极管对直流真空断路器强迫换流分断特性的影响 彭振东, 任志刚, 沙新乐, 李博, 杨晨光, 邹顺 (7152)

· 高电压技术 ·

复合支柱绝缘子界面热波模型及其界面缺陷无损检测方法 郭晨望, 涂彦昕, 刘立帅, 梅红伟, 王黎明 (7160)

基于宽频正弦场空间电荷响应的陷阱评估 杨帆帆, 缪林鑫, 孙国强, 吴建东, 尹毅 (7169)

直流 GIL 气-固界面电荷调控的影响因素分析 王哲铭, 潘越, 张磊, 丁浩, 王亚, 王泽众, 张周胜 (7177)

· 英文概述见论文电子版 ·

期刊基本参数: CN11-2107/TM * 1964 * S * A4 * 366 * zh * P * ¥84.00 * 4000 * 31 * 2021-10 版权所有 未经许可不得转载及上网

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

Vol.41 No.20 (Ser. 679)

Oct. 20, 2021

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** •

Multi-energy Heterogeneous Load Regulation Framework and Key Technology Analysis Under Clean Heating Mode
.....SUN Yi, LI Zekun, BAO Huiyu, LIU Chunlei, PANG Pengfei (6827)

• **Large Power Grid Planning and Operation** •

Research Framework and Prospect on Power System Inertia Estimation
.....ZHANG Wuqi, WEN Yunfeng, CHI Fangde, WANG Kang, LI Li (6842)
Coordinated Dispatch Model for Integrated Electricity and Natural Gas Systems Considering Load Flexibilities and
Network Topology Optimization..... ZHAO Xia, FENG Xinxin, DAI Rong, WANG Luo (6856)
Research Status and Prospects of Detection, Correction and Recovery for Abnormal Synchrophasor Data in Power System
.....XU Feiyang, XUE Ancheng, CHANG Naichao, KONG He, XU Jingsong (6869)
Distributionally Robust Coordinated Expansion Planning for Generation and Transmission Systems With Demand Response
.....CHEN Baorui, LIU Tianqi, HE Chuan, HU Xiaotong, SU Xueneng (6886)
Transient Synchronous Stability of PLL-based Wind Power-synchronous Generation Interconnected Power System in
Rotor Speed Control Timescale.....TANG Wangqianyun, ZHOU Baorong, HU Jiabing, GUO Zeren, ZHANG Rui (6900)
Study on Improving Transient Stability Margin of Power Grid by Energy Storage System Based on Critical-cutset Identification
.....LI Peiqiang, SUN Peidong, LI Xinran, ZHAO Wei, LEI Ertao (6916)

• **Smart Grid** •

Blockchain-oriented Behind-the-meter Microgrid and Its Peer-to-peer Distributed Transaction Model With Energy Blocks
.....MU Chenggang, DING Tao, QU Ming, HE Yuankang, WANG Yongqing, CHEN Tian'en (6927)
Research on Frequency Modulation Ancillary Service Market Based on Three Parameter Power Law Model of Wind Power to
Predict the Day-ahead Frequency Modulation Demand..... GUO Yufeng, PAN Mengqi (6941)
Synergetic Operational Optimization of Generation and Transmission in Power Systems With Rapid Line Screening
.....LU Mingxuan, ZHOU Ming, HUANG Hanyan, LI Gengyin (6949)
Detection Method of Arc High Resistance Grounding Fault in Resonant Grounding System Based on Dynamic Trajectory of
Volt-ampere Characteristic.....WANG Bin, CUI Xin (6959)
High Frequency Impedance Differential Protection With High Proportion of Photovoltaic Power Distribution Network
.....CHAO Chenxu, ZHENG Xiaodong, GAO Piao, TAI Nengling, TU Qi, SUN Tianjia, LI Weibin, AN Yiran (6968)
Discussion on Characteristics of Compensation Circuits for Tuned Half-wavelength Transmission Lines Based on Filter Design
.....CAO Pulin, FAN Haoran, WANG Deng, SHU Hongchun, HAN Yiming, YANG Bo, DONG Jun (6979)
An Improved Hybrid Neural Network Ultra-short-term Photovoltaic Power Forecasting Method Based on
Cloud Image Feature Extraction.....YU Guangzheng, LU Liu, TANG Bo, WANG Siyuan, YANG Xiu, CHEN Rusi (6989)

• **Power Generation** •

A New Analytical Method for Process Modification of Thermal Cycle: Cycle Splitting Method
.....YANG Yongping, XIN Tuantuan, XU Cheng (7003)
Review of Rim-seal Performance and Flow Mechanism in Turbine Cavity
.....YIN Zhao, LI Yaoyang, ZHANG Hualiang, WANG Jiahui, CHEN Haisheng (7014)
Dual-mode Energy Management Method Considering Optimization of Fuel Cell Efficiency Range
.....GAN Rui, LI Qi, JIANG Shuna, MENG Xiang, CHEN Weigrong (7027)
Emission Characteristics of Mercury in 1000MW Ultra-supercritical Coal-fired Unit
.....ZHANG Yi, YE Yunyun, GU Yongzheng, ZHANG Qingsong, SHI Xiaohong,
ZHANG Shuai, WANG Jiawei, WANG Tao, ZHANG Yongsheng (7039)
Modifications on Wagner's Method of Fitting Equations to Vapor Pressure.....YIN Jianguo, KE Jinjun, ZHAO Guanxia, MA Suxia (7046)

• **Power Electronics and Drives** •

Key Factors and Methodology of High-performance Design Automation Solver for Power Electronics
.....YUAN Liqiang, LU Zixian, DAI Yuxuan, ZHAO Zhengming (7055)
IGBT Electro-thermal Simulation Under Dynamic Avalanche Condition Considering Distribution of Electro-thermal Stress on Chip
.....MA Tianzhao, LUO Yifei, JIA Yingjie, LI Xin, SHI Zenan (7068)
The Fault Tolerance Control Method in Three-level T-type Inverter Parallel System
.....CHEN Zhiyuan, CHEN Jie, XING Xiangyang, LI Xiaoyan, FU Youliang, ZHANG Chenghui (7079)
Research on Multi-level Feature Extraction Model of Converter Transformer Vibration Signal
.....ZHANG Zhanlong, XIAO Rui, WU Yongye, JIANG Peiyu, DENG Jun, PAN Zhicheng (7093)
Fault-tolerant Operation Strategy of Modular Multilevel Converter With Multiple Faulty Switches Based on a Simplified SVM
.....BAI Zhihong, LI Yifei, MA Hao (7104)

• **Electric Machines and Apparatus** •

Analytic Calculation of Pole-to-Pole Faults in Twelve-phase Synchronous Generator-rectifier systems
.....MA Fan, FU Lijun, GUO Yunjun, YI Xinqiang, JI Feng (7117)
Review and Analysis of Electromagnetic Structure and Magnetic Field Regulation Technology of
the Permanent Magnet Synchronous Motor..... KOU Baoquan, ZHAO Xiaokun, ZHANG Haoquan, WANG Mengyao (7126)
Small-capacitor Drive System of Axial Flux PM Motor Based on Virtual DC Bus Structure
.....ZHANG Chao, XU Lei, ZHU Xiaoyong, DU Yi, QUAN Li (7141)
Influences of Series Connected Diode on the Forced Commutation Interruption Characteristics for DC Vacuum Circuit Breaker
.....PENG Zhendong, REN Zhigang, SHA Xinle, LI Bo, YANG Chenguang, ZOU Shun (7152)

• **High Voltage Engineering** •

Interfacial Thermal Wave Model of Composite Post Insulator and Its Nondestructive Detection Method on Interfacial Defects
.....GUO Chenjun, TU Yanxin, LIU Lishuai, MEI Hongwei, WANG Liming (7160)
Trap Assessment Based on Space Charge Response Under Broadband Sinusoidal Field
.....YANG Fanfan, MIAO Linxin, SUN Guoqiang, WU Jiandong, YIN Yi (7169)
Analysis of Charge Tailoring Techniques for DC GIL Gas-solid Interface Charges
.....WANG Zheming, PAN Yue, ZHANG Lei, DING Hao, WANG Ya, WANG Zezhong, ZHANG Zhousheng (7177)

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