

ISSN 0258 - 8013
CODEN ZDGXER

中国电机工程学报

半月刊

第 42 卷 第 22 期

Proceedings of the CSEE

SEMIMONTHLY

Vol.42 No.22

中国电机工程学报

第四十二卷

第二十二期

二〇二二年十一月

Proceedings of the CSEE

Vol.42

No.22 November 2022



11月
2022
2022-11-20 出版

ISSN 0258-8013



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 42 卷

第 22 期 (总第 705 期)

2022 年 11 月 20 日

目 次

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

· 大电网规划与运行 ·

- 面向受端电网暂态电压稳定的高压直流系统主动控制研究..... 吕哲, 葛怀畅, 郭庆来, 王彬, 孙宏斌 (8041)
柔性直流输电的阻抗重塑及中高频振荡抑制方法..... 彭意, 郭春义, 杜东冶 (8053)
基于多元经验模态分解的电力系统强迫振荡源定位..... 姜涛, 刘博涵, 李雪, 李国庆 (8063)
基于径向基函数随机响应面法的综合能源系统概率能流计算
..... 陈乾, 张沈习, 程浩忠, 王舒萍, 原凯, 宋毅, 韩丰 (8075)

· 智能电网 ·

- 互联异步电网 VSC-HVDC 的惯量与阻尼模拟控制策略
..... 朱介北, 王晓南, 俞露杰, 刘娜, 葛延峰, 李霞林, 王成山 (8089)
共享理念下的区域能源互联网生态系统价值共创模式与机制..... 陈娟, 鲁斌, 冯宇博, 李筱笛 (8103)
基于混沌理论的风电功率超短期预测模式改进研究..... 杨茂, 孙志博, 苏欣 (8117)
基于深度强化学习技术的光伏-固体氧化物燃料电池混合能源系统多场景控制
..... 宋雨桐, 陈涛, 高赐威, 宋梦, 胡秦然 (8129)
考虑压气站运行特性的电-气最优能流两阶段方法..... 赵霞, 戴蓉, 王骆, 谭红 (8140)
基于 AA-SVRPF 的配电网负荷供应能力不确定性评估..... 吴红斌, 王旻洋, 丁明, 孙鸣, 毕锐, 徐斌 (8153)

· 继电保护、通信及自动化 ·

- 考虑多端协同的柔性直流电网直流故障保护和恢复策略..... 陈力绪, 袁帅, 严俊, 贾秀芳, 许建中, 赵成勇 (8164)
基于行波全波形能量分布特征的高阻接地故障检测方法
..... 邓丰, 徐帆, 冯思旭, 曾祥君, 黄懿菲, 曾哲, 张振 (8177)
基于差分积聚量的柔性直流线路单端高速保护..... 周泽昕, 戴飞扬, 郭雅蓉, 柳焕章, 曹虹, 王兴国 (8190)

· 发电 ·

- 计及源荷不确定性的综合能源生产单元运行调度与容量配置两阶段随机优化..... 左逢源, 张玉琼, 赵强, 孙立 (8205)
煤粉燃烧过程中 CH_i 官能团对含硫组分演化的作用机理..... 马红和, 韩洋, 李春玉, 吕嗣晨, 崔志刚, 周璐 (8215)
超大型湿式冷却塔干湿混合雨区正交优化研究..... 张政清, 王明勇, 张德英, 陈瑞, 何锁盈, 高明 (8224)
水泵水轮机水环特性及其控制..... 张飞, 陈振木, 祝宝山 (8232)
电絮凝处理补给水中有机物的动力学分析及响应面优化..... 朱志平, 贺明鹏, 周攀, 童家鑫, 江源康, 王正刚 (8243)

· 电力电子与电力传动 ·

- 高带宽差分电压探头: 模型、设计与评测..... 王宇雷, 曾正, 孙鹏, 王亮 (8252)
基于 TCM 控制的多相交错并联 Buck/Boost 软开关变换器的变频范围优化方法
..... 赵明, 陈建良, 韩伟健, 李楚杉 (8265)
一种直流侧带双辅助二极管的 24 脉波整流器..... 姚绪梁, 李磊, 王景芳, 吕雨生, 刘瑜超, 陈启明 (8276)
三相 Vienna 整流器的载波断续脉宽调制优化算法..... 张哲, 邢岩, 张犁, 邹宇航, 明岩 (8288)
半桥-全桥子模块混合型桥臂复用 MMC 的拓扑及故障穿越策略研究..... 王琛, 陶建业, 王毅, 谭开东, 许同 (8297)
一种利用可切换补偿电容的三线圈无线电能传输系统互感识别及效率优化方法
..... 刘旭, 宋翔昱, 原熙博, 夏晨阳, 伍小杰 (8309)

· 电机与电器 ·

- 双翼型翅片管水冷的浇注式变压器绕组精细化热路建模方法..... 肖飞, 张新生, 王瑞田, 任强 (8321)
永磁直线同步电机的变权重系数多步模型预测电流控制方法..... 王安鹏, 黄旭珍, 李立毅, 冯静 (8332)
单变流器驱动多分段并联长初级双边直线感应电动机模型与控制策略
..... 张明远, 史黎明, 徐飞, 朱海滨, 郭科宇 (8343)
多单元永磁同步电机功率分配最大转矩电流比控制..... 李桂丹, 任宗芹, 李斌, 马晓晨 (8352)
高效轻质变漏磁永磁电机变工况铁耗特性研究..... 万振宇, 樊德阳, 朱孝勇, 周雪, 项子旋, 全力 (8363)
余弦削极转子磁通切换永磁电机设计与性能分析..... 王培欣, 花为, 胡铭颢, 张志恒, 王宇辰, 程明 (8372)

· 高电压技术 ·

- 长持续时间雷电流电弧下材料损伤的电-磁-热-力耦合分析..... 肖慈恩, 刘亚坤 (8382)
检测 SF_6 分解特征组分的 MoS_2 纳米片气敏特性与机理研究..... 陈达畅, 唐炬, 张晓星, 吴鹏, 李祎, 刘惠军 (8390)
高能电子辐照对双向拉伸聚丙烯薄膜的微观结构及介电性能影响
..... 冯宇, 何梓源, 杨智捷, 盛捷, 迟庆国, 陈庆国 (8405)

· 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.22 (Ser. 705)

Nov. 20, 2022

CONTENTS

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

- **Large Power Grid Planning and Operation** •
 - Research on Active Control of HVDC System for Transient Voltage Stability of Receiving-end Grid
..... LYU Zhe, GE Huaichang, GUO Qinglai, WANG Bin, SUN Hongbin (8041)
 - Research on Medium and High Frequency Oscillation Suppression Approach Based on Impedance Tuning in Flexible HVDC System
..... PENG Yi, GUO Chunyi, DU Dongye (8053)
 - Forced Oscillation Location in Power Systems Using Multiple Empirical Mode Decomposition
..... JIANG Tao, LIU Bohan, LI Xue, LI Guoqing (8063)
 - Probabilistic Energy Flow Calculation for Integrated Energy Systems Based on Radial Basis Function-stochastic Response
Surface Method CHEN Qian, ZHANG Shenxi, CHENG Haozhong, WANG Shuping, YUAN Kai, SONG Yi, HAN Feng (8075)
- **Smart Grid** •
 - Inertia and Damping Emulation Control Strategy of VSC-HVDC Transmission System for Asynchronous Grid Interconnection
..... ZHU Jiebei, WANG Xiaonan, YU Lujie, LIU Na, GE Yanfeng, LI Xialin, WANG Chengshan (8089)
 - Value Co-production Model and Mechanism of Regional Energy Internet Ecosystem Under the Concept of Sharing
..... CHEN Juan, LU Bin, FENG Yubo, LI Xiaodi (8103)
 - Research on Improvement of Ultra-short-term Wind Power Forecasting Model Based on Chaos Theory
..... YANG Mao, SUN Zhibo, SU Xin (8117)
 - Deep Reinforcement Learning-based Multiple Scenario Control Strategy for PV-SOFC Hybrid System
..... SONG Yutong, CHEN Tao, GAO Ciwei, SONG Meng, HU Qinran (8129)
 - Two-stage Method for Optimal Power-gas Flow Considering the Operation Characteristics of Compressor Station
..... ZHAO Xia, DAI Rong, WANG Luo, TAN Hong (8140)
 - Uncertainty Evaluation of Load Supply Capability for Distribution Network Based on AA-SVRPF
..... WU Hongbin, WANG Mingyang, DING Ming, SUN Ming, BI Rui, XU Bin (8153)
- **Power System Relaying, Communication and Automation** •
 - DC Fault Protection and Recovery Strategy for VSC-HVDC Grid Considering Multi-terminal Cooperation
..... CHEN Lixu, YUAN Shuai, YAN Jun, JIA Xiufang, XU Jianzhong, ZHAO Chengyong (8164)
 - Research on High Impedance Fault Detection Method Based on Energy Distribution Characteristics of Traveling Wave Full Waveform
..... DENG Feng, XU Fan, FENG Sixu, ZENG Xiangjun, HUANG Yifei, ZENG Zhe, ZHANG Zhen (8177)
 - Single Terminal Fast Protection for Flexible HVDC Lines Based on Differential Accumulation
..... ZHOU Zexin, DAI Feiyang, GUO Yarong, LIU Huanzhang, CAO Hong, WANG Xingguo (8190)
- **Power Generation** •
 - Two-stage Stochastic Optimization for Operation Scheduling and Capacity Allocation of Integrated Energy Production Unit
Considering Supply and Demand Uncertainty ZUO Fengyuan, ZHANG Yuqiong, ZHAO Qiang, SUN Li (8205)
 - Impact of CH₄ Functional Group on Sulfur Species Evolution in Pulverized Coal Combustion
..... MA Honghe, HAN Yang, LI Chunyu, LYU Sichen, CUI Zhigang, ZHOU Lu (8215)
 - Study on Orthogonal Optimization for the Super-large Wet Cooling Tower With Dry-wet Hybrid Rain Zone
..... ZHANG Zhengqing, WANG Mingyong, ZHANG Deying, CHEN Rui, HE Suoying, GAO Ming (8224)
 - Water-ring Characteristics and Control of Pump-turbine ZHANG Fei, CHEN Zhenmu, ZHU Baoshan (8232)
 - Kinetic Analysis and Response Surface Optimization of Electroflocculation Treatment of Organics in Make-up Water
..... ZHU Zhiping, HE Mingpeng, ZHOU Pan, TONG Jiaxin, JIANG Yuankang, WANG Zhenggang (8243)
- **Power Electronics and Drives** •
 - High Bandwidth Differential Voltage Probe: Model, Design, and Assessment .. WANG Yulei, ZENG Zheng, SUN Peng, WANG Liang (8252)
 - A Frequency Variation Range Reduction Method for Multi-phase Parallel Interleaved Buck/Boost ZVS Converter Under TCM Control
..... ZHAO Ming, CHEN Jianliang, HAN Weijian, LI Chushan (8265)
 - A 24-pulse Rectifier With Two Auxiliary Diodes at DC Side
..... YAO Xuliang, LI Lei, WANG Jingfang, LYU Yusheng, LIU Yuchao, CHEN Qiming (8276)
 - Optimized Carrier-based Discontinuous PWM Schemes for Three-phase Vienna-type Rectifiers
..... ZHANG Zhe, XING Yan, ZHANG Li, ZOU Yuhang, MING Yan (8288)
 - Research on Topology and Fault Ride-through Strategy of Hybrid Arm Multiplexing MMC Composed of HBSPs and FBSPs
..... WANG Chen, TAO Jianye, WANG Yi, TAN Kaidong, XU Tong (8297)
 - A Mutual Inductance Identification and Efficiency Optimization Method for the Three-coil Wireless Power Transfer System by
Utilizing Switchable Compensation Capacitor LIU Xu, SONG Xiangyu, YUAN Xibo, XIA Chenyang, WU Xiaojie (8309)
- **Electric Machines and Apparatus** •
 - A Detailed Thermal Network Modeling Method of Water-cooled Epoxy-cast Transformer Windings With Double-wing Finned Tubes
..... XIAO Fei, ZHANG Xinsheng, WANG Ruitian, REN Qiang (8321)
 - Variable Weight Coefficient Multi-step Model Predictive Current Control Method for Permanent Magnet Linear Synchronous Motor
..... WANG Anpeng, HUANG Xuzhen, LI Liyi, FENG Jing (8332)
 - Modeling and Control Strategy of Long Primary Double-sided Linear Induction Motor Segmented in Parallel Fed by a Single Inverter
..... ZHANG Mingyuan, SHI Liming, XU Fei, ZHU Haibin, GUO Keyu (8343)
 - Maximum Torque Per Ampere Control of Multi-unit Permanent Magnet Synchronous Motor Under Power Sharing
..... LI Guidan, REN Zongqin, LI Bin, MA Xiaochen (8352)
 - Research on Iron Loss Characteristics of a High-efficiency Light-weight Variable-leakage-flux Permanent Magnet Motor Considering
Multiple Operation Conditions WAN Zhenyu, FAN Deyang, ZHU Xiaoyong, ZHOU Xue, XIANG Zixuan, QUAN Li (8363)
 - Design and Performance Analysis of Flux-switching Permanent Magnet Machine With Cos-chamfering Rotor
..... WANG Peixin, HUA Wei, HU Mingjin, ZHANG Zhiheng, WANG Yuchen, CHENG Ming (8372)
- **High Voltage Engineering** •
 - Electromagnetic-thermal-mechanical Coupling Analysis on Damage of Material Inflicted by Long Continuing Current in
Direct Lightning Strike XIAO Ci'en, LIU Yakun (8382)
 - Detection of SF₆ Decomposition Products Using MoS₂ Nanoflakes: Gas Sensing Properties Combined With Mechanism Study
..... CHEN Dachang, TANG Ju, ZHANG Xiaoxing, WU Peng, LI Yi, LIU Huijun (8390)
 - Effect of High-energy Electron Irradiation on the Microstructure and Dielectric Properties of Biaxially Oriented Polypropylene Films
..... FENG Yu, HE Ziyuan, YANG Zhijie, SHENG Jie, CHI Qinguo, CHEN Qingguo (8405)
- **For Extended Summaries, Please See the Electronic Journals** •