

QK1712749
CODEN ZDGXER

中国电机工程学报

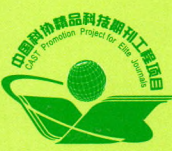
半月刊

第 37 卷 第 12 期

Proceedings of the CSEE

SEMIMONTHLY

Vol.37 No.12



6月
2017
2017-06-20 出版

ISSN 0258-8013



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

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

Vol.37 No.12 (Ser. 575)

Jun. 20, 2017

CONTENTS

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

- **Smart Grid** •
 - Research Framework and Basic Models for Cloud Energy Storage in Power System LIU Jingkun, ZHANG Ning, KANG Chongqing (3361)
 - Modeling, Analysis and Damping Control of DC Grid LI Yunfeng, TANG Guangfu, WU Yanan, YANG Jie (3372)
 - Study on DC Voltage Slope Control Strategy Considering the Optimal Unbalanced Power Allocation JIANG Binkai, WANG Zhixin, ZOU Jianlong, SHI Li (3383)
 - Analysis of DC Overvoltage Caused by DC Short-circuit Fault in Zhangbei VSC-Based DC Grid LI Yingbiao, BU Guangquan, WANG Shanshan, YUN Lei, et al (3391)
 - Study of Improved Arrester Based Last Circuit Breaker Protection Strategy Based on Voltage-Energy Inverse Proportional Characteristics LIN Xiangning, HE Yingfa, XIE Zhicheng, et al (3400)
 - I/O Interface Design for FPGA Based Real-time Simulator of Active Distribution Networks LI Peng, ZENG Fanpeng, WANG Zhiying, WANG Chengshan, DING Chengdi, et al (3409)
 - Bi-level Joint Optimization Dispatch of Active Distribution Network Considering the Participation of Multi-stakeholder HUANG Wei, LI Ningkun, LI Wenxuan, LIU Qi, LIU Zifa (3418)
- **Large Power Grid Planning and Operation** •
 - A Fast Assessment Method for Evaluating Commutation Failure Risk of Multi-infeed HVDC Systems SHAO Yao, TANG Yong (3429)
 - Cloud Computing Stochastic Dynamic Programming Algorithms for Long-term Optimal Operation of Cascaded Hydropower Stations ZHOU Dongqing, PENG Shiyu, CHENG Chuntian, WANG Jian (3437)
 - Interaction Analysis of Hydro-Coupled Power Plants Based on Relative Gain Array Method ZOU Jin, LAI Xu (3449)
 - Wind Power Forecasting Method Based on Generalized Autoregressive Conditional Heteroskedasticity With Skewness and Kurtosis Model CHEN Hao, GAO Shan, WANG Yurong, ZHANG Jianzhong (3456)
- **Grid Integration of Renewable Energy Resources** •
 - Wind Farm Primary Frequency Control Strategy Based on Wind & Thermal Power Joint Control LIU Jizhen, YAO Qi, LIU Yu, HU Yang (3462)
 - Optimal Dispatch for Joint Operation of Wind Farm and Combined Heat and Power Plant With Thermal Energy Storage DAI Yuanhang, CHEN Lei, MIN Yong, XU Fei, HOU Kaiyuan, ZHOU Ying (3470)
 - Research on the Compressive Sensing Based Fault Location Within the Collection System of a Large-scale Photovoltaic Power Plant JIA Ke, GU Chenjie, BI Tianshu, CHEN Yiru, REN Zhefeng (3480)
- **Power Generation** •
 - Digital Diagnosis of Combustion in the Utility Boiler ZHANG Xiangyu, ZHANG Yifan, LU Xu, XU Hongjie (3490)
 - Thermodynamic Analysis of the Efficient Flue Gas Waste Heat Utilization System With Raw Coal Pre-dried of Power Plant LI Yongyi, XU Gang, XUE Xiaojun, ZHENG Qingqing, XU Cheng, YANG Yongping (3498)
 - Experimental Study on Water Recovery and Heat Transfer Characteristics of Lignite Drying Exhaust QIN Yuanzhi, FU Hao, WANG Jinshi, LIU Ming, YAN Junjie (3506)
 - Study on Off-Design Characteristics of Combined Heat and Power Based on Combined Cycle Gas Turbine Units YANG Cheng, HUANG Zhifeng, MA Xiaolian (3514)
 - Study on Superheat Degree Dynamic Response of Ultra Supercritical Unit's Intermediate Point Caused by Primary Frequency Regulation GU Junjie, WANG Peng, BAI Zhizhong, ZHANG Yan (3525)
- **Power Electronics and Drives** •
 - Characteristic Analysis and a Circulating Current Control Method in Modular Multilevel Converters under Unbalanced Grid Conditions LI Jinke, JIN Xinmin, WU Xuezhi, et al (3535)
 - A Novel Passively Clamped Resonant DC-link Inverter WANG Qiang, HU Fei, WANG Tianshi, LIU Xiaoqin (3545)
 - An Interleaved Three-level Forward Converter With Variable Turns Ratio YANG Guanghao, JI Baojian, HONG Feng, LI Longchun (3555)
 - A Novel DC Voltage and Reactive Power Balance Control Strategy for Cascaded H Bridge Rectifier PAN Hongbin, ZHU Hongzhang, XIAO Zhiyong, ZHU Maokun, et al (3565)
 - Flyback-based Three-port Converters for Electrolytic Capacitor-less LED Drivers WANG Fei, LI Lin, ZHONG Yuanxu, SHU Xinyi (3574)
 - A Low Voltage Ride Through Strategy for Nine-switch-converter Doubly-fed Wind Generation System Based on the DC-link Voltage Dynamic Assignment CHEN Yu, WEN Gang, KANG Yong (3583)
- **Electric Machines and Apparatus** •
 - Design Optimization Research of Air-core Permanent Magnet Permanent Magnet Synchronous Linear Motor Based on Gravity Neighborhood Center Algorithm SONG Juncai, DONG Fei, ZHAO Jiwen, et al (3594)
 - Research on the Fault Tolerant Control and Its Dynamic Performance of Brushless Permanent Magnet Motor With Faults in Hall Sensor DONG Lianghui, LIU Jinglin (3602)
 - Principle and Implementation of a Novel Bearingless Flux-switching Motor WANG Xiaolin, NI Tuocheng, DING Qiang, DENG Zhiquan (3612)
 - Special Spun High Birefringence Elliptical Polarization-maintaining Fiber and Its Application in Current Sensor LIU Jianming, HUANG Yong (3621)
 - A Real-time Rain Flow Algorithm and Its Application to State of Health Modeling for LiCoO₂ Lithium-ion Batteries BIN Yang, YU Jingmei, ZHU Yingkai, XU Hongfei, et al (3627)
- **High Voltage Engineering** •
 - Investigation on Discharge Polarity Effect of CF₃I/N₂ Gas Mixtures Under Lightning Impulse ZHAO Su, XIAO Dengming, ZHANG Hui, DENG Yunkun (3636)
 - Prediction of Dissolved Gases in Oil for Transformer Based on Grey Theory-Variational Mode Decomposition and Support Vector Machine Improved by NSGA-II XIAO Huaishuo, LI Qingquan, SHI Yalin, ZHANG Tongqiao, Zhang Jiwei (3643)
 - An Improved Electric Geometry Model Based on Breakdown Test of Long Air Gaps and Suited for Large-Sized Transmission Lines WANG Yu, DENG Yejiang, WEN Xishan, et al (3654)
- **For Extended Summaries, Please See the Electronic Journals.**



目 次

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

· 智能电网 ·

电力系统云储能研究框架与基础模型.....刘静琨, 张宁, 康重庆 (3361)

直流电网建模分析与阻尼控制研究.....李云丰, 汤广福, 吴亚楠, 杨杰 (3372)

计及不平衡功率最优分配的直流电压斜率控制策略研究.....江斌开, 王志新, 邹建龙, 史莉 (3383)

张北柔直电网工程直流线路短路过程中直流过电压分析.....李英彪, 卜广全, 王姗姗, 云雷, 等 (3391)

基于电压-能量反比特性的避雷器型最后断路器保护优化策略研究.....林湘宁, 何英发, 谢志成, 等 (3400)

基于 FPGA 的有源配电网实时仿真器 I/O 接口设计.....李鹏, 曾凡鹏, 王智颖, 王成山, 丁承第, 等 (3409)

考虑多利益主体参与的主动配电网双层联合优化调度.....黄伟, 李宁坤, 李玟萱, 刘琦, 刘自发 (3418)

· 大电网规划与运行 ·

一种快速评估多馈入直流系统换相失败风险的方法.....邵瑶, 汤涌 (3429)

梯级水电站群长期优化调度云计算随机动态规划算法.....周东清, 彭世玉, 程春田, 王健 (3437)

基于相对增益阵列方法的水电站多机水力耦合系统交互影响分析.....邹金, 赖旭 (3449)

基于广义自回归条件异方差偏度峰度模型的风电功率预测方法.....陈昊, 高山, 王玉荣, 张建忠 (3456)

· 可再生能源并网技术 ·

风火联合调度的风电场一次调频控制策略研究.....刘吉臻, 姚琦, 柳玉, 胡阳 (3462)

风电场与含储热的热电联产联合运行的优化调度.....戴远航, 陈磊, 闵勇, 徐飞, 侯凯元, 周莹 (3470)

基于压缩感知技术的大型光伏电站汇集系统故障定位研究.....贾科, 顾晨杰, 毕天姝, 陈奕汝, 任哲锋 (3480)

· 发电 ·

电站锅炉数字化燃烧检测.....张向宇, 张一帆, 陆续, 徐宏杰 (3490)

带原煤预干燥的电站高效烟气余热利用系统热力学分析.....李永毅, 徐钢, 薛小军, 郑清清, 等 (3498)

褐煤干燥乏气水回收与换热特性实验研究.....秦远智, 付豪, 王进仕, 刘明, 严俊杰 (3506)

联合循环热电联产机组变工况性能分析.....杨承, 黄志峰, 马晓茜 (3514)

超超临界机组一次调频动作中间点过热度动态特性研究.....谷俊杰, 王鹏, 白智中, 张岩 (3525)

· 电力电子与电力传动 ·

不平衡交流电网模块化多电平变流器特性分析及环流抑制方法.....李金科, 金新民, 吴学智, 等 (3535)

新型无源钳位谐振直流环节逆变器.....王强, 胡斐, 王天施, 刘晓琴 (3545)

变匝比交错并联三电平正激变换器.....杨广浩, 嵇保健, 洪峰, 李龙春 (3555)

级联 H 桥整流器的新型直流电压与无功平衡控制策略.....盘宏斌, 朱鸿章, 肖志勇, 朱茂琨, 等 (3565)

反激式三端口无电解电容 LED 驱动电路拓扑.....汪飞, 李林, 钟元旭, 舒心怡 (3574)

基于直流电压动态分配的九开关双馈风电系统低电压穿越策略研究.....陈宇, 文刚, 康勇 (3583)

· 电机与电器 ·

基于重心邻域算法的无铁心永磁同步直线电机优化设计研究.....宋俊材, 董菲, 赵吉文, 等 (3594)

霍尔传感器故障下的永磁无刷电机容错控制及其动态性能研究.....董亮辉, 刘景林 (3602)

一种新型无轴承磁通切换电机原理及其实现.....王晓琳, 倪拓成, 丁强, 邓智泉 (3612)

特殊螺旋高双折射保椭圆光纤研究及其在电流互感器中的应用.....刘建明, 黄勇 (3621)

实时雨流计数法及其在钴酸锂电池健康状态建模中的应用.....宾洋, 于静美, 朱英凯, 徐鸿飞, 等 (3627)

· 高电压技术 ·

冲击电压下 CF₃I/N₂ 混合气体放电电极性效应研究.....赵谏, 肖登明, 张辉, 邓云坤 (3636)

灰色理论-变分模态分解和 NSGA-II 优化的支持向量机在变压器油中气体预测中的应用.....肖怀硕, 李清泉, 施亚林, 张同乔, 张纪伟 (3643)

基于长间隙放电试验适用于大尺寸输电线路的改进电气几何模型.....王羽, 邓冶强, 文习山, 等 (3654)

· 行业信息 ·

“超超临界循环流化床锅炉技术”专题征稿启事..... (3436)

“电力电子变压器”专题征稿启事..... (3662)

· 英文概述见论文电子版

期刊基本参数: CN11-2107/TM * 1964 * S * A4 * 302 * zh * P * ¥84.00 * 4000 * 33 * 2017-6 版权所有 未经许可不得转载及上网

《中国电机工程学报》第四届编辑委员会成员

主任委员：郑宝森

副主任委员：谢明亮 郑健超 周孝信 郭剑波 刘伟

委员：丁明 马伟明 王成山 司凤琪 刘吉臻 刘进军 刘建明 孙元章 孙秋野
 (按姓氏笔画排序) 朱宝田 毕天姝 汤广福 汤涌 许世森 阮新波 何湘宁 别朝红 吴少华
 吴青华 宋永华 张小平 张文亮 张文涛 张东霞 张伯明 张沛 李文沅
 李兴源 李成榕 李武华 束国刚 杨寿敏 步学朋 邱家驹 邹国棠 邹继斌
 陈小良 陈树勇 陈海生 陈维江 陈道炼 周波 郑楚光 金红光 姚良忠
 荣命哲 骆仲泱 徐文远 徐殿国 涂春鸣 郭烈锦 崔翔 康重庆 曹一家
 梅生伟 章明川 曾嵘 程时杰 程明 蒋敏华 廖瑞金 蔡小舒 蔡宁生
 穆钢

顾问：丰镇平 王锡凡 白晓民 关志成 危师让 余贻鑫 杨奇逊 赵淳生 陶文铨
 (按姓氏笔画排序) 美国德州A&M大学Singh Chanan 英国曼彻斯特大学Peter Crossley
 日本早稻田大学Ryuichi Yokoyama (横山隆一)

编委会秘书：韩蕾

中国电机工程学报

(半月刊, 1964年创刊)

第37卷第12期 2017年6月20日出版

版权所有

Proceedings of the CSEE

(Semimonthly, started in 1964)

Vol.37 No.12 Jun.20, 2017

© 2017 Chinese Society for Electrical Engineering

主 管	中国科学技术协会	Competent Authorities	China Association for Science & Technology
主 办	中国电机工程学会	Sponsor	Chinese Society for Electrical Engineering(CSEE)
主 编	汤涌	Editor-in-Chief	Tang Yong
副 主 编	邱家驹 朱宝田 张东霞 穆钢 杨寿敏 李武华	Associate Editor-in-Chief	Qiu Jiaju Zhu Baotian Zhang Dongxia Mu Gang Yang Shoumin Li Wuhua
编辑出版	《中国电机工程学报》编辑部	Editor & Publisher	Editorial Board of Proceedings of the CSEE
地 址	100192北京清河小营东路15号 中国电力科学研究院内	Editorial office	Xiaoyingdonglu 15, Qinghe, Beijing 100192, China
编辑部主任	韩蕾	Director	Han Lei
电 话	010-82415657(传真) 010-82812534 010-82812545 010-82812974	Tel/Fax	86-10-82415657 86-10-82812534 86-10-82812545 86-10-82812974
电子 邮 件	pcsee@epri.sgcc.com.cn	E-mail	pcsee@epri.sgcc.com.cn
网 址	http://www.pcsee.org	http	www.pcsee.org
印 刷	北京科信印刷有限公司 102208北京昌平七北路马连店甲6号	Distributed Abroad by	China International Book Trading Corporation(GUOJI SHUDIAN) P.O.Box 399, Beijing, China
国内 发 行	北京报刊发行局	Publication Number	ISSN 0258-8013
国外 发 行	中国国际图书贸易总公司	CODEN	ZDGXER

中国标准连续出版物号：ISSN 0258-8013
CN 11-2107/TM

邮发代号：国际M5746
国内82-327

国内定价：每册 84 元 全年 2016 元