

2017 IEEE Electrical Power and Energy Conference (EPEC 2017)

**Saskatoon, Saskatchewan, Canada
22-25 October 2017**



**IEEE Catalog Number: CFP17EPE-POD
ISBN: 978-1-5386-0818-0**

**Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP17EPE-POD
ISBN (Print-On-Demand):	978-1-5386-0818-0
ISBN (Online):	978-1-5386-0817-3
ISSN:	2381-2842

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Program

2017 IEEE Electrical Power and Energy Conference (EPEC)

Session 1: Solar Energy

<i>Solar Photovoltaic Power in Manitoba</i>	
Carl Ho (University of Manitoba, Canada), Reynald Andico (University of Manitoba, Canada), Raveen Mudiyansele (University of Manitoba, Canada)	1
<i>A New Energy-Efficient Topology for Solar-Powered Capacitive Deionization Systems</i>	
Ashraf Seleyem (British University in Egypt, Egypt)	7
<i>Design and Implementation of a Low Cost Web Server Using ESP32 for Real-Time Photovoltaic System Monitoring</i>	
Ibrahim Allafi (Memorial University of Newfoundland & Faculty of Engineering & Applied Science, Canada), Mohammad Tariq Iqbal (Memorial University of Newfoundland, Canada)	13
<i>Kalman Filter-Based Maximum Power Point Tracking for PV Energy Resources Supplying DC Microgrid</i>	
Haytham AbdEl-Gawad (University of Ontario Institute of Technology, Canada), Vijay K. Sood (University of Ontario Institute of Technology, Canada)	18

Session 4: Data Analytics and Computation Methods

<i>Distribution Network Reconfiguration with the Application of DLMP Using Genetic Algorithm</i>	
Habib Rajabi Mashhadi (Ferdowsi University of Mashhad, Iran), Saeed Nematshahi (Ferdowsi University of Mashhad, Iran)	26
<i>Performance Analysis of GPU-Accelerated Fast Decoupled Power Flow Using Direct Linear Solver</i>	
Shengjun Huang (University of Alberta, Canada & National University of Defense Technology, P.R. China), Venkata Dinavahi (University of Alberta, Canada)	31
<i>Optimizing Electric Taxi Charging System: A Data-Driven Approach from Transport Energy Supply Chain Perspective</i>	
Yinghao Jia (Tsinghua University & Sparkzone Institute, P.R. China), Yide Zhao (Sparkzone Institute, P.R. China), Ziyang Guo (Sparkzone Institute, P.R. China), Yu Xin (Sparkzone Institute, P.R. China), Huimiao Chen (Tsinghua University, P.R. China)	37
<i>Quantification of Changes in Surface Texture of Thermally-Aged Kraft Paper Using Orthogonal Wavelets</i>	
Nathan Jacob (Manitoba Hydro, Canada), Sherif Sherif (University of Manitoba, Canada), Behzad Kordi (University of Manitoba, Canada)	43
<i>Probabilistic Available Delivery Capability Assessment of General Distribution Network with Renewables</i>	
Hao Sheng (Cornell University, USA), Xiaozhe Wang (McGill University, Canada)	47

Session 2: DG and Microgrids

<i>Voltage Stability-Constrained Energy Management in Industrial Microgrids with Renewable Energy Sources</i>	
Masoud Esmaili (Iran University of Science and Technology, Iran), Shahin Masouminejad (West Tehran Branch, Islamic Azad University, Iran)	53
<i>Multi-agent Coordination of Distributed Energy Storage Systems for Mitigating Renewable Energy Resources High Ramp-Rate Issues</i>	
Nader El-Taweel (York University, Canada), Hany Farag (YorkU, Canada)	59

<i>Wind Turbine Control Based on a Permanent Magnet Synchronous Generator Connected to an Isolated Electrical Network</i>	
Paul Makanga Koumba (Université du Québec à Trois-Rivières, Canada), Ahmed Cheriti (Université du Québec à Trois Rivières, Canada), Mamadou Lamine Doumbia (Université du Québec à Trois-Rivieres, Canada), Allal El Moubarek Bouzid (Université du Québec à Trois Rivières, Canada), Hicham Chaoui (Carleton University, Canada)	65
<i>Interlinked Hybrid Microgrids with Fault Confining Capability Using a Novel MMC Topology</i>	
Ahmed Sallam (University of Waterloo, Canada), Mohmmmed Nassar (University of Waterloo, Canada), Ragi Hamdy (Alexandria University, Egypt), Magdy Salama (University of Waterloo, Canada)	72
<i>Real Option Valuation of Flexibilities in the Integrated Planning of Natural Gas-Fired Distributed Generators and Natural Gas Distribution System</i>	
Babatunde Odetayo (University of Calgary, Canada), John MacCormack (University of Calgary, Canada), Bill Rosehart (University of Calgary, Canada), Hamidreza Zareipour (University of Calgary, USA)	77

Session 5: Electric Vehicles

<i>Design of 3.3 kW Wireless Battery Charger for Electric Vehicle Application Considering Bifurcation</i>	
Kunwar Aditya (UOIT, Canada), Vijay K. Sood (University of Ontario Institute of Technology, Canada)	83
<i>An Energy Management Approach for Electric Vehicle Fast Charging Station</i>	
Yuchong Huo (McGill University, Canada), Francois Bouffard (McGill University, Canada), Geza Joos (McGill University, Canada)	89
<i>Compare Motors of Toyota Prius and Synchronous Reluctance for Using in Electric Vehicle and Hybrid Electric Vehicle</i>	
Alireza Siadatan (West Tehran Branch, Islamic Azad University, Iran), Mehdi Kholousi adab (West Tehran Branch, Islamic Azad University, Iran), Houman Kashian (The Hague, The Netherlands)	95
<i>Optimizing Electric Vehicles Charging Cost for Frequency Regulation Support in a Smart Grid</i>	
Olalekan Kolawole (University of Regina, Canada), Irfan S. Al-Anbagi (University of Regina, Canada)	101
<i>Evaluation of Electric Vehicle Penetration in a Residential Sector Under Demand Response Considering Both Cost and Convenience</i>	
Zhanle Wang (University of Regina, Canada), Raman Paranjape (University of Regina, Canada)	107

Session 3: DG and Microgrids

<i>Simulation of Microgrid System with Distributed Generation</i>	
Faizan Khan (UOIT, Canada), Mohammad Ali (UOIT, Canada), Vijay K. Sood (University of Ontario Institute of Technology, Canada), Faruk Bhuiyan (Virelec Ltd, Canada), Phillip Insull (Virelec Ltd, Canada), Faraz Ahmad (Virelec Ltd, Canada)	112
<i>Nonlinear Reactive Power Control Scheme to Maximize Penetration of Distributed Generation in Distribution Networks</i>	
Amrit Singh (University of Toronto, Canada), Peter W Lehn (University of Toronto, Canada)	118
<i>Practical Power Distance Test Tool Based on OPF to Assess Feeder DG Hosting Capacity</i>	
Zhijun Wang (Carleton University, Canada), Xiaoyu Wang (Carleton University, Canada), Liangxiang Tang (Hydro One Networks Inc., Canada)	124
<i>A Real Case Application of ROCOF and Vector Surge Relays for Anti-Islanding Protection of Distributed Energy Resources</i>	
Alexandre B Nassif (ATCO Electric, Canada), Colin Madsen (ATCO Electric, Canada)	130

Session 6: Wind Energy

<i>Study of an Optimized Wind-Diesel Hybrid System for Canadian Remote Sites</i>	
Youssef Saad (Université Technologique de Bellfort, Lebanon), Chadi Nohra (Beirut Arabic University, Lebanon), Rafic Younes (Lebanese University, Faculty of Engineering, Lebanon), Saïd Abboudi (Laboratoire ICB CNRS, UTBM, Université de Bourgogne Franche-Comté, France), Adrian Ilinca (Université du Québec à Rimouski, Canada), Hussein Ibrahim (Cegep de Sept-Îles & Institut Technologique de Maintenance Industrielle, Canada), Zoe Feger (Cegep de Sept-Îles & Institut Technologique de Maintenance Industrielle, Canada)	135
<i>Declining Cost of Renewable Energy Technology</i>	
Chukwuma Leonard Azimoh (University of Johannesburg, South Africa), Babu Paul (University of Johannesburg, South Africa), Charles Mbohwa (University of Johannesburg, South Africa)	141
<i>Utilizing Phase Shifting Transformer for Effective Integration of Wind Generation</i>	
Iraj Rahimi Pordanjani (AltaLink, Canada), Fayaz Qureshi (Power Industry, Canada), Ali Jafari (Altalink, Canada), Ryan Cui (AltaLink, Canada)	147
<i>Optimal Power Flow in Distribution Networks with High Penetration of Photovoltaic Units</i>	
Tianjian Wang (State University of New York at Buffalo, USA), Matin Meskin (SUNY at Buffalo, USA), Yiting Zhao (SUNY at Buffalo, USA), Ilya Grinberg (SUNY Buffalo State College, USA)	154

Session 10: Power Electronics, FACTS

<i>An Improved HERIC Inverter with Zero-Current-Switching</i>	
Jian Yang (Central South University, P.R. China), Jingtao Xu (Central South University, P.R. China), Peng Yang (Central South University, P.R. China), Hui Wang (Central South University, P.R. China), Mei Su (Central South University, P.R. China), Mengtian Shen (State Grid Hunan Electric Power Company, P.R. China)	160
<i>Dynamic Performance and Small-Signal Analysis of a DC-DC Step-Up Converter with High-Gain Output Rectifier for Offshore Wind Turbines</i>	
Mehdi Abbasi (York University, Canada), John Lam (York University, Canada)	166
<i>Analysis on Operation Conditions of UPFC in Nanjing Western Power System in 2016</i>	
Hui Cai (State Grid Jiangsu Economic Research Institute, Nanjing, P.R. China), Siqi Bu (The Hongkong Polytechnic University, P.R. China), Xi Wu (Southeast University, P.R. China)	172
<i>Power Quality Improvement Using Novel Dynamic Voltage Restorer Based on Power Electronic Transformer</i>	
Ali Kalantari Khalilabad (Science and Research Branch, Islamic Azad University, Tehran, Iran), Mehdi Talei (West Tehran Branch, Islamic Azad University, Iran), Alireza Siadatan (West Tehran Branch, Islamic Azad University, Iran), Seyed Matin Hosseini Rad (Armanpey Construction Company, Iran)	178
<i>Insulation Properties of SF6/N2 Gas Mixtures Under High Pressure and Low Ratio</i>	
Chaohai Zhang (State Grid Electric Power Research Institute, China, P.R. China)	184

Session 7: Power System Protection

<i>A Universal Synchrophasor Based Test Platform</i>	
Xiaodong Liang (Memorial University of Newfoundland, Canada)	188
<i>On-Line Gas Monitoring for Increased Transformer Protection</i>	
Mickel Saad (ABB, Canada), Ed teNyenhuis (ABB, Canada)	194
<i>Temperature Estimation and Vibration Monitoring for Induction Motors</i>	
Xiaodong Liang (Memorial University of Newfoundland, Canada)	198
<i>Optimum Design of an Inner Slider Tubular Linear PM Synchronous Actuator</i>	
Alireza Siadatan (West Tehran Branch, Islamic Azad University, Iran), Niloofar Shoja Razavi (West Tehran Branch, Islamic Azad University, Iran), Seyedmansour Hosseini Rad (Department of Fluid Mechanic, Varia Tarh Pars Co., Iran)	204

<i>Time to Voltage Collapse Dependence of Load Shedding to Avoid Voltage Collapse</i>	
Tara Alzahawi (March Consulting, Canada)	210

Session 11: Power System Reliability

<i>Reliability Assessment of Hydro Dominant Systems with Diurnal Energy Management</i>	
Fang Fang (University of Saskatchewan, Canada), Rajesh Karki (University of Saskatchewan, Canada)	215
<i>Seasonal Reservoir Management in Hydro Dominant Power Systems to Enhance Availability</i>	
Navjot Chattha (University of Saskatchewan, Canada), Rajesh Karki (University of Saskatchewan, Canada), Fang Fang (University of Saskatchewan, Canada)	220
<i>A Novel Reliability Evaluation Method of AC/DC Hybrid Power System with the Injection of Wind Power</i>	
Can Wang (Xi'an Jiaotong University, P.R. China), Haipeng Xie (Xi'an Jiaotong University, P.R. China), Shiyu Liu (Xi'an Jiaotong University, P.R. China), Zhaohong Bie (Xi'an Jiaotong University, P.R. China)	225
<i>Reliability Evaluation of Bulk Power System Considering Compressed Air Energy Storage</i>	
Osama Aslam Ansari (University of Saskatchewan, Canada), Safal Bhattarai (University of Saskatchewan, Canada), Rajesh Karki (University of Saskatchewan, Canada), Chi Yung Chung (University of Saskatchewan, Canada)	231
<i>Impact of the Penetration Levels of PV and Synchronous Machine Based DG Sources on the Reliability of a Microgrid</i>	
Prajwal Gautam (University of Saskatchewan, Canada), Keaton A Wheeler (University of Saskatchewan, Canada), Rajesh Karki (University of Saskatchewan, Canada), Sherif Faried (University of Saskatchewan, Canada)	237

Session 13: Power System Dynamics and Stability

<i>Demonstration of Voltage Stability by Comparing Dynamic Simulations and Quasi Steady State Analysis</i>	
Sarin Rajapakse (University of Manitoba, Canada), Udaya Annakkage (University of Manitoba, Canada)	243
<i>Parameter Validation for Kalman Filter Based Dynamic State Estimation of Power Plant Dynamics</i>	
Avishek Paul (McGill University, Canada & Power Grid Corporation of India, India), Innocent Kamwa (Hydro-Québec/IREQ, Canada), Geza Joos (McGill University, Canada)	247
<i>Modal Identification of Power System Oscillation Using Parametric DFT Technique</i>	
Sakthivel Rajmurugan (Memorial University of Newfoundland, Canada), Benjamin Jeyasurya (Memorial University, Canada)	253
<i>Impact of Fast Charging Stations on the Voltage Flicker in the Electric Power Distribution Systems</i>	
Sami Alshareef (University of Ontario Institute of Technology, Canada, Canada), Walid Morsi (University of Ontario Institute of Technology, Canada)	259
<i>Induction Motors Lifetime Expectancy Analysis Subject to Regular Voltage Fluctuations</i>	
Chaohai Zhang (State Grid Electric Power Research Institute, China, P.R. China)	265

Session 8: Power System Protection

<i>A Microgrid Protection Scheme Using Differential and Adaptive Overcurrent Relays</i>	
Keaton A Wheeler (University of Saskatchewan, Canada), Sherif Faried (University of Saskatchewan, Canada), Mohamed Elsamahy (The Higher Institute of Engineering, Al-Shorouk Academy, Egypt)	271

<i>Digital Relaying Scheme for Protection of Shunt-Compensated Transmission Lines</i>	
Om Hari Gupta (Dayalbagh Educational Institute, Faculty of Engineering, Agra, India), Manoj Tripathy (Indian Institute of Technology Roorkee, India), Vijay K. Sood (University of Ontario Institute of Technology, Canada)	277
<i>FPGA Implementation of a Phaselet Method for High Speed Distance Relaying - Preliminary Results</i>	
Shane Jin (University of Saskatchewan, Canada), Ramakrishna (Rama) Gokaraju (University of Saskatchewan, Canada), Eli Fortunato Pajuelo (University of Saskatchewan, Canada)	283
<i>Particular PV Grid-Connected System Under Symmetrical and Asymmetrical Faults Analysis</i>	
Browh Serge Tekpeti (Xi'an Jiaotong University, P.R. China), Xiaoning Kang (Xi'an Jiaotong University, P.R. China), Mostafa Kheshti (Shandong University, P.R. China)	288
<i>Fault Analysis of Accurate PV Connected System Against Dynamic Fast Solar Radiation Fluctuation</i>	
Browh Serge Tekpeti (Xi'an Jiaotong University, P.R. China), Xiaoning Kang (Xi'an Jiaotong University, P.R. China), Mostafa Kheshti (Shandong University, P.R. China)	294

Session 12: Power Electronics, HVDC

<i>Energization and Regulation of a Hybrid HVDC Grid with LCC and VSC</i>	
Naushath Mohamed Haleem (University of Manitoba, Canada), Athula Rajapakse (University of Manitoba, Canada), Aniruddha Gole (University of Manitoba, Canada), Ioni Fernando (Manitoba Hydro, Canada)	300
<i>Synchronous Switching for Parallel-Connected DC-DC Boost Converters</i>	
Muamer Shebani (Memorial University of Newfoundland, Canada), Tariq Iqbal (& Memorial University of Newfoundland, Canada), John Quaicoe (Memorial University of Newfoundland, Canada)	306
<i>A Novel Efficient Tri-State Boost Converter</i>	
Hua Han (Central South University, P.R. China), Ruya Tan (Central South University, P.R. China), Jian Yang (Central South University, P.R. China), Hui Wang (Central South University, P.R. China), Sijie Ning (Central South University, P.R. China), Mengtian Shen (State Grid Hunan Electric Power Company, P.R. China)	312
<i>Dynamic Model of an Interleaved Modular Multilevel DC-DC Converter for MVDC and HVDC Systems</i>	
Yang Gao (University of Alberta, Canada), Nicolas Faria (University of Alberta, Canada), Gregory J Kish (University of Alberta, Canada)	318
<i>Teaching IEC 61850 Based Substation Automation Through Hands-on Experiences</i>	
Sachintha Kariyawasam (University of Manitoba, Canada), Achintha Wickremasuriya (Teshmont Consultants LP, Canada), Athula Rajapakse (University of Manitoba, Canada)	326

Session 14: Power Systems Control

<i>Detection of False Data Injection in Automatic Generation Control Systems Using Kalman Filter</i>	
Mohsen Khalaf (University of Waterloo, Canada), Amr Youssef (Concordia University, Canada), Ehab El-Saadany (Waterloo University, Canada)	332
<i>Dispatching Thermostatically Controlled Loads for Frequency Regulation Using Adversarial Multi-armed Bandits</i>	
Amr Mohamed (University of Toronto, Canada), Antoine Lesage-Landry (University of Toronto, Canada), Joshua Taylor (University of Toronto, Canada)	338
<i>Comparison Between Experimental Results and Simulation of a Fuel Cell Powered DC Motor Using PID Controller</i>	
Mohamed Albarghot (Memorial University of Newfoundland, Canada), Faisal Alkarrami (Memorial University, Canada), Siu O'Young (Mun, Canada), Luc Rolland (CEO, LART – Lenoir Automation Robots Technologies, Canada)	344

<i>Simplex Optimization Procedure for Tuning Damping Controller Parameters for Type III DFIG Wind Generators</i>	
Jason Pannell (University of Saskatchewan, Canada), Olivier Larocque (SaskPower, Canada), Ramakrishna (Rama) Gokaraju (University of Saskatchewan, Canada)	349
<i>Multi Area Load Frequency Control of Interconnected Power Systems Using JAYA</i>	
Jagdeep Singh Lather (National Institute of Technology Kurukshetra, India), Sukhwinder Singh Dhillon (Ambala College of Engineering and Applied Research, India)	355

Session 9: Smart Grid and Cyber Security

<i>Load Reduction Probabilistic Model for Smart Grid Network Economic Dispatch Problem</i>	
Zakareya Hasan (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada)	361
<i>Identification of Critical Buses Based on Betweenness-Centrality in a Smart Grid</i>	
Mitch Campion (University of North Dakota, USA), Prakash Ranganathan (University of North Dakota, USA)	368
<i>An Active Distribution Network Model for Smart Grid Control and Protection Studies—Model Validation Progress</i>	
Aboutaleb Haddadi (Polytechnique Montreal, Canada), Jean Mahseredjian (Polytechnique Montréal, Canada), Hossein Hooshyar (KTH Royal Institute of Technology, Sweden), Luigi Vanfretti (KTH Royal Institute of Technology, Sweden), Christian Dufour (Opal-RT Technologies, Canada)	373
<i>Performance Analysis of Dimensionality Reduction Techniques for Demand Side Management</i>	
Ahmed Aleshinloye (University of Regina, Canada), Abdul Bais (University of Regina, Canada), Irfan S. Al-Anbagi (University of Regina, Canada)	378

Poster Session 1

<i>Grid Search Optimization Techniques for the Indirect Vector-Controlled Induction Motor Drives</i>	
Fuzi Lftisi (Memorial University of Newfoundland & Memorial University of Newfoundland, Canada), Glyn George (Memorial University of Newfoundland, Canada), Casey Butt (Memorial University of Newfoundland, Canada), Adel Aktaibi (Memorial University of Newfoundland & Red Deer College, Canada), Aziz Rahman (IEMD - Chair, Canada)	384
<i>Application of Flexible Alternating-Current Transmission System in Jiangsu Power Grid</i>	
Hui Cai (State Grid Jiangsu Economic Research Institute, Nanjing, P.R. China), Siqi Bu (The Hongkong Polytechnic University, P.R. China), Tianran Yin (Southeast University, P.R. China), Xi Wu (Southeast University, P.R. China)	390
<i>Long-term Charging Demand Modeling and Analysis</i>	
Yi Zhang (State Grid Fujian Electric Power Research Institute, P.R. China), Bin Chen (Electric Power Research Institute of Fujian Electric Power Company Limited, P.R. China), Yue Xiang (Sichuan University, P.R. China), Wei Yang (Sichuan University, P.R. China), Junyong Liu (Sichuan University, P.R. China), Youbo Liu (Sichuan University, P.R. China)	395
<i>A Novel Life Evaluation Algorithm of XLPE Power Cables Based on Biclustering</i>	
Zijian Tan (Guangzhou Power Supply Co., Ltd, P.R. China), Guoyan Chen (Guangzhou Power Supply Co., Ltd, P.R. China), Le Luan (Guangzhou Power Supply Co., Ltd, P.R. China), Zeyuan Yu (South China University of Technology, P.R. China), Ran Zhang (South China University of Technology, P.R. China), Wenhui Tang (South China University of Technology, P.R. China)	400
<i>CCM-DCM Average Current Control for Both Continuous and Discontinuous Conduction Modes Boost PFC Converters</i>	
Lei Wang (South China University of Technology, P.R. China), Qinghua Wu (South China University of Technology, P.R. China), Wenhui Tang (South China University of Technology, P.R. China), Zeyuan Yu (South China University of Technology, P.R. China), Wei Ma (Chongqing University of Science and Technology, P.R. China)	405

<i>Ant-Based Optimal Tuning of PID Controllers for Load Frequency Control in Power Systems</i>	
Michael Bernard (University of Alberta - Edmonton, Alberta, Canada), Petr Musilek (University of Alberta, Canada)	411
<i>Feasibility Study of Cogeneration for A Gas Power Plant</i>	
Pooya Taheri (SFU & Langara College, Canada)	417
<i>Probabilistic Load Flow Analysis for ADN Optimal Operation</i>	
Wei Huang (North China Electric Power University, P.R. China), Shuwen Yang (North China Electric Power University, P.R. China), Liangliang Hua (East Inner Mongolia Electric Power Company Limited, P.R. China), Zhaorui Guo (North China Electric Power University, P.R. China), Juan Wu (North China Electric Power University, P.R. China), Liangjun Ge (North China Electric Power University, P.R. China)	422
<i>Optimal Dispatching for Active Distribution Network with Wind-battery Hybrid Power System</i>	
Yuwei Ma (Shandong University, P.R. China), Guibin Zou (Shandong University, P.R. China), Meiyi Hou (Shandong University, P.R. China), Qinglu Dong (State Grid Shijiazhuang Electric Power Company, P.R. China), Jingjing Yang (State Grid Weifang Electric Power Company, P.R. China)	428
<i>Analytic Approximation of Fault Current Contributed by DC Capacitors in VSC-HVDC Pole-to-pole Fault</i>	
Yueyang Ma (Shandong University, P.R. China), Guibin Zou (Shandong University, P.R. China), Zhanjun Gao (Shandong University, P.R. China), Chenjun Sun (State Grid Hebei Electric Power Company, P.R. China), Tao Du (Shanda Electric Power Company, P.R. China), Yingliang Liu (Shanda Electric Power Company, P.R. China)	434
<i>Characteristics Analysis and Practical Model of UHVDC Systems Under Large Disturbance</i>	
Jian Zhao (Hohai University, P.R. China), Ping Ju (Hehai University, P.R. China), Qian Chen (Hohai University, P.R. China), Xue Lin (Hohai University, P.R. China), Chuan Qin (Hohai University, P.R. China)	440
<i>Simulation on Power Characteristic of UHVDC During Commutation Failure and DC Block</i>	
Fanfan Li (Hohai University, P.R. China), Qian Chen (Hohai University, P.R. China), Xue Lin (Hohai University, P.R. China), Ping Ju (Hehai University, P.R. China), Haoqing Xiong (State Grid Henan Electric Company, P.R. China), Xin Shan (State Grid Corporation of China, P.R. China), Bo Wang (State Grid Corporation of China, P.R. China), Chuan Qin (Hohai University, P.R. China), Jian Zhao (Hohai University, P.R. China), Meng Jiang (Hohai University, P.R. China)	446
<i>A Linear Programming Model for Coordinated Low- Carbon Generation and Transmission Expansion Planning</i>	
Vahid Asgharian (Laval University, Canada), Morad Abdelaziz (Laval University, Canada)	452
<i>An Overview of Optimization Methods for Tidal Instream and Wind Turbines Farms</i>	
Ali Fituri (Dalhousie University, Canada), Hamed Aly (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada)	458

Session 15: Energy Storage

<i>Economy of Residential Photovoltaic Generation and Battery Energy Storage in Alberta, Canada</i>	
Shida Zhang (University of Alberta, Canada), Rodrigo Martins (University of Alberta, Canada), Mustafa Gul (University of Alberta, Canada), Petr Musilek (University of Alberta, Canada)	463
<i>Investigation of BESSs' Benefits in Transmission and Distribution Systems Operations Using Integrated Power Grid Co-optimization</i>	
Seyed Masoud Mohseni-Bonab (Laval University, Canada), Innocent Kamwa (Hydro-Québec/IREQ, Canada), Ali Moeini (Hydro-Québec/IREQ, Canada), Abbas Rabiee (University of Zanjan, Zanjan, Iran)	468
<i>Control of Microgrids with Distributed Energy Storage Operating in Islanded Mode</i>	
Chu Sun (McGill University, Canada), Geza Joos (McGill University, Canada), Francois Bouffard (McGill University, Canada)	474

<i>Distributed Energy Storage Operation Strategy for Retailers Based on Evolutionary Game Theory</i>	
Yi Zhang (Tsinghua University, P.R. China), Qixin Chen (Tsinghua University, P.R. China), Qing Xia (Tsinghua University, P.R. China), Fenyu Huangfu (Inner Mongolia Economic and Technical Research Institute, P.R. China)	481

Session 16: Electricity Markets

<i>Proactive Planning and Activation of Manual Reserves in Sequentially Cleared Balancing Markets</i>	
Martin Håberg (Norwegian University of Science and Technology & Statnett, Norway), Gerard Doorman (Norwegian University of Science and Technology, Norway)	487
<i>Investigation of Net Metering as a Tool for Increasing Electricity Access in Developing Countries</i>	
Chukwuma Leonard Azimoh (University of Johannesburg, South Africa), Oliver Dzobo (University of Johannesburg, South Africa), Charles Mbohwa (University of Johannesburg, South Africa)	493
<i>A Novel Multiple Fuels' Cost Function for Realistic Economic Load Dispatch Needs</i>	
Ali R. Al-Roomi (Dalhousie University & College of Engineering, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada)	499
<i>Probabilistic Commercial Load Profiles at Different Climate Zones</i>	
Sami Alshareef (University of Ontario Institute of Technology, Canada, Canada), Walid Morsi (University of Ontario Institute of Technology, Canada)	505

Poster Session 2

<i>An Overview of Forecasting Techniques for Load, Wind and Solar Powers</i>	
Gamal Aburiyana (Dalhousie, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada)	512
<i>Characterization of Commercial LED Lamps for Power Quality Studies</i>	
Radwa Abdalaal (University of Manitoba, Canada), Carl Ho (University of Manitoba, Canada)	519
<i>An Online Framework for Integration of Demand Response in Residential Load Management</i>	
Shamwil Ahmed (McGill University, Canada), Francois Bouffard (McGill University, Canada)	525
<i>Optimal Power Flow Incorporating Wind Energy and Load Reduction by BH Algorithm and KOA Algorithm</i>	
Zakareya Hasan (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada)	531
<i>Effective Weather/Frequency-Based Transmission Line Models—Part I: Fundamental Equations</i>	
Ali R. Al-Roomi (Dalhousie University & College of Engineering, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada)	538
<i>Fixed Head Hydrothermal Scheduling Incorporating Wind Energy by Khums Optimization Algorithm</i>	
Zakareya Hasan (Dalhousie University, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada)	544
<i>A New Modified Maximum Power Extraction Technique for Wind and Hybrid Renewable Energy Systems</i>	
Kajanan Kanathipan (York University, Canada), John Lam (York University, Canada)	551
<i>Adaptive Hysteresis Current Control of Active Power Filters for Power Quality Improvement</i>	
Allal El Moubarek Bouzid (Université du Québec a Trois Rivières, Canada), Pierre Sicard (Université du Québec à Trois-Rivières, Canada), Ahmed Cheriti (Université du Québec a Trois Rivières, Canada), Hicham Chaoui (Carleton University, Canada), Paul Makanga Koumba (Université du Québec à Trois-Rivières, Canada)	557
<i>Design and Implementation of Laboratory Scale Static Var Compensator to Demonstrate Dynamic Load Balancing and Power Factor Correction</i>	
Vianey Mateo (University of Manitoba, Canada), Aniruddha Gole (University of Manitoba, Canada), Carl Ho (University of Manitoba, Canada)	565

<i>Cuckoo-Search Optimized Fuzzy-Logic Control of Stationary Battery Storage Systems</i>	
Cong Nam Truong (Technical University of Munich, Germany), Daniel May (University of Alberta, Canada), Rodrigo Martins (University of Alberta, Canada), Petr Musilek (University of Alberta, Canada), Andreas Jossen (Technische Universität München, Germany), Holger C Hesse (Technische Universität München, Germany)	571
<i>Scheduling of Electrical Vehicle Charging for a Charging Facility with Single Charger</i>	
Bala Venkatesh (Ryerson University, Canada), Isuru Vidanalage (Ryerson University, Canada), Ricardo Torquato (University of Campinas, Brazil), Waldir Freitas (UNICAMP, Brazil)	577
<i>Effective Weather/Frequency-Based Transmission Line Models—Part II: Prospective Applications</i>	
Ali R. Al-Roomi (Dalhousie University & College of Engineering, Canada), Mohamed E. El-Hawary (Dalhousie University, Canada)	583

Session 17: Data Analytics and Computation Methods

<i>An Advanced Multistage Multi-Step Tidal Current Speed and Direction Prediction Model</i>	
Nima Safari (University of Saskatchewan, Canada), Benyamin Khorramdel (University of Saskatchewan, Canada), Alireza Zare (University of Saskatchewan, Canada), Chi Yung Chung (University of Saskatchewan, Canada)	591
<i>A Spatiotemporal Wind Power Prediction Based on Wavelet Decomposition, Feature Selection, and Localized Prediction</i>	
Nima Safari (University of Saskatchewan, Canada), Yiwen Chen (University of Saskatchewan, Canada), Benyamin Khorramdel (University of Saskatchewan, Canada), Le-Ping Mao (University of Saskatchewan, Canada), Chi Yung Chung (University of Saskatchewan, Canada)	597
<i>Short-Term Load Forecasting Based on Higher Order Partial Least Squares (HOPLS)</i>	
Jiangfeng Jiang (Xi'an Jiaotong University, P.R. China), Gengfeng Li (Xi'an Jiaotong University, P.R. China), Zhaohong Bie (Xi'an Jiaotong University, P.R. China), Huan Xu (Xi'an Jiaotong University, P.R. China)	603
<i>Fuzzy Logic Based Parameter Adjustment Model for Adaptive Decayed Brain Emotional Learning Network with Application to Online Time Series Prediction</i>	
Houssen Milad (Dalhousie University, Canada), Umar Farooq (University of The Punjab, Pakistan), Mohamed E. El-Hawary (Dalhousie University, Canada), Valentina E. Balas (Aurel Vlaicu University of Arad, Romania), Muhammad Asad (The University of Lahore, Pakistan)	608

Session 18: Data Analytics and Computation Methods

<i>Maximization of Reliability of Stochastic Multiple Machines Power System Based on the Quasi Hamiltonian System</i>	
Xue Lin (Hohai University, P.R. China), Ping Ju (Hehai University, P.R. China), Lixia Sun (Hohai University, P.R. China)	614
<i>A Quantified Resilience Assessment Approach for Electrical Power Systems Considering Multiple Transmission Line Outages</i>	
Xiaonan Liu (Tianjin University & Key Laboratory of Smart Grid of Ministry of Education, P.R. China), Kai Hou (Tianjin University & Key Laboratory of Smart Grid of Ministry of Education, P.R. China), Jia Hongjie (Tianjin University, P.R. China), Yunfei Mu (Tianjin University, P.R. China), Xiaodan Yu (Tianjin University & Key Laboratory of Smart Grid of Ministry of Education, P.R. China), Yue Wang (Tianjin University & Key Laboratory of Smart Grid of Ministry of Education, P.R. China), Jialin Dong (East District Branch of State Grid Tianjin Electric Power Company, P.R. China)	619
<i>Detecting a Distributed Denial of Service Attack Using a Pre-Processed Convolutional Neural Network</i>	
Maryam Ghanbari (University of Manitoba, Canada), Witold Kinsner (University of Manitoba, Canada), Ken Ferens (University of Manitoba, Canada)	624

