

2021 IEEE 12th International Symposium on Power Electronics for Distributed Generation Systems (PEDG 2021)

**Virtual Conference
28 June – 1 July 2021**



**IEEE Catalog Number: CFP21PEG-POD
ISBN: 978-1-6654-4643-3**

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IEEE Catalog Number:	CFP21PEG-POD
ISBN (Print-On-Demand):	978-1-6654-4643-3
ISBN (Online):	978-1-6654-0465-5
ISSN:	2329-5759

Additional Copies of This Publication Are Available From:

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PEDG 2021 PROGRAM

NOTE: All timings below are in U.S. Eastern Daylight Time zone

Monday, June 28

8:00 am Tutorial 1 (Tutorial Stage A)
Power Management and Converter Control for Hybrid AC/DC Microgrids...N/A
Kai Sun, Tsinghua University (Academia)

Tutorial 2 (Tutorial Stage B)
Grid Forming Energy Storage: Design Challenges, Technical Performance Results and Market Opportunities for the World First Large Scale Virtual Synchronous Machine Connected to the Australian National Power System...N/A
Stanislav Cherevatskiy, Hitachi ABB Power Grids (Industry)
Andrew Tuckey, Hitachi ABB Power Grids (Industry)
John Glassmire, Hitachi ABB Power Grids (Industry)

9:45 am Break

10:00 am Tutorial 3 (Tutorial Stage A)
Reliability of Power Electronics in PV Systems: Design and Control Solutions...N/A
Ariya Sangwondgwanich, Aalborg University (Academia)
Frede Blaabjerg, Aalborg University (Academia)

Tutorial 4 (Tutorial Stage B)
Electrified Aerospace Propulsion and High Bandwidth Power Hardware in Loop test Platform: Raytheon Technologies Research Center...N/A
Parag Kshirsagar, Raytheon Technologies Research Center (Industry)
Xin Wu, Raytheon Technologies Research Center (Industry)
Suman Dwari, Raytheon Technologies Research Center (Industry)
Jagadeesh K. Tangudu, Raytheon Technologies Research Center (Industry)
Jung-Muk (Michael) Choe, Raytheon Technologies Research Center (Industry)
Parikshith Channegowda, Raytheon Technologies Research Center (Industry)

11:45 am Break

12:00 pm Tutorial 5 (Tutorial Stage A)

SiC Devices for Power Electronic Systems: Status, Challenges, and Prospects...N/A

Victor Veliadis, Power America Institute (Industry)

Tutorial 6 (Tutorial Stage B)

Hybrid AC and DC Networked Microgrids Towards Grid Modernization: Control, Optimal Design, and Implementation...N/A

Feng Qiu, Argonne National Laboratory (National Laboratory) *Jianzhe*

Liu, Argonne National Laboratory (National Laboratory) *Xiaonan Lu*,

Temple University (Academia)

Xuan Wu, American Electric Power (Industry)

1:45 pm Break

2:00 pm Tutorial 7 (Tutorial Stage A)

Solid state Circuit Protection for Distributed Power Grids...N/A

John Shen, Illinois Institute of Technology (Academia)

Tutorial 8 (Tutorial Stage B)

3.3-kV SiC MOSFETs: Power Packaging and System Applications...N/A

Juan Carlos Balda, University of Arkansas at Fayetteville (Academia)

Alan Mantooh, University of Arkansas at Fayetteville (Academia)

Yue Zhao, University of Arkansas at Fayetteville (Academia)

Yuxiang Chen, University of Arkansas at Fayetteville (Academia)

Tuesday, June 29

8:00 am Keynote I (Master Stage)

Power Decoupling and Pulse Energy Modulation for Single-Phase Grid-Connected Inverters...N/A

Liuchen Chang

Chair: *Sudip K. Mazumder*, University of Illinois at Chicago, USA

8:40 am Changeovers

8:45 am Keynote II (Master Stage)

Power Electronics Distribution Systems (PEDS) enabled by Navy Integrated Power Electronics Building Block (NiPEBB) and through Navy Integrated Power and Energy Corridor (NIPEC)...N/A

Lynn Petersen

Chair: *Sudip K. Mazumder*, University of Illinois at Chicago, USA

9:20 am Changeovers

9:25 am Keynote III (Master Stage)

Overview of ARPA-E Supported Transmission and Distribution Technologies Enabling a Resilient Grid of the Future...N/A

Isik Kizilyalli and Danny Cunningham

Chair: *Sudip K. Mazumder*, University of Illinois at Chicago, USA

10:00 am Break

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1a: Cyber-Security & Mitigation I

Chair: *Ke Ma*, Shanghai Jiaotong University, China

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12:00 pm Invited Talk (Master stage)

Chair: *Mohammad Shadmand*, University of Illinois at Chicago, USA

12:40 pm Break

Stage 1: 12:50 pm -1:55pm

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Chair: *Moien Mohamadi*, University of Illinois at Chicago, USA

Stage 3: 12:50 pm - 1:55pm

Virtual Booth (GRAPES)

Chair: *Congbo Bao*, University of Illinois at Chicago, USA

Stage 4: 12:50 pm - 1:55pm

Virtual Booth (Typhoon HIL)

Chair: *Shantanu Gupta*, University of Illinois at Chicago, USA

1:55 pm Break

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Yasuhiko Onishi

Chair: *Juan Balda*, University of Arkansas, USA

8:40 am Changeovers

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Design for Reliability in PV Systems...N/A

Frede Blaabjerg

Chair: *Juan Balda*, University of Arkansas, USA

9:20 am Changeovers

9:25 am Keynote VI (Master Stage)

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Chair: *Juan Balda*, University of Arkansas, USA

Stage 1: 10:10 am -11:50am

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Master Stage: 12:00 pm - 12:40pm

12:00 pm Invited Talk (Master stage)

Chair: *John Shen*, Illinois Institute of Technology, USA

12:40 pm Break

Stage 1:12:50 pm -1:55pm

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Virtual Booth (Power America)

Chair: *Mohammad A. Abbaszada*, University of Illinois at Chicago, USA

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Virtual Booth (UNBC)

Chair: *Nanditha R. Gajanur*, University of Illinois at Chicago, USA

Stage 4: 12:50 pm - 1:55pm

Virtual Booth (Fuji Electric)

Chair: *Mohsen Hosseinzadehtaher*, University of Illinois at Chicago, USA

1:55 pm Break

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6a : Grid Connected Systems

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Thursday, July 1

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Jinjun Liu

Chair: *Adel Nasiri*, University of Wisconsin at Milwaukee, USA

8:40 am Changeovers

8:45 am Keynote VIII (Master Stage)

Grid Modernization: Technological Advancements Beyond Smart Grid...N/A

John D. McDonald

Chair: *Adel Nasiri*, University of Wisconsin at Milwaukee, USA

9:20 am Changeovers

9:25 am Keynote IX (Master Stage)

Scaling Energy Access Solutions – Challenges and Opportunities...N/A

Deepak Divan

Chair: *Adel Nasiri*, University of Wisconsin at Milwaukee, USA

10:00 am Break

Stage 1: 10:10 am -11:50am

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Chair: *Ghanshyamsinh Gohil*, Hitachi ABB Power Grids, USA

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Pecastaing

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11:10 am Virual Power Plant Integration into a Vertically Integrated Utility: A Case Study...615

Ashot Mnatsakanyan, Christos Iraklis, Ali Hussain Almazrooqi, Hamad Albeshr

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7c Sustainable Energy Misc Topic II

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10:10 am An Overview of Quantum Security for Distributed Energy Resources...620

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10:30 am A Modified Push-Pull Topology with Phase-shift Modulation...627

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10:50 am Electric Machine Emulator in Voltage-Response Mode with Differentiator Compensation...634

Yuhao Qi, Ke Ma, Weiyu Tang

11:10 am Enhanced Frequency-Locked Loop Based on a Third-Order Generalized Integrator...640

Jiayu Fang, Shuying Yang, Zhen Xie, Lingxiang Wang

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Chair: *Niraj Shrestha*, University of Illinois at Chicago, USA

- 10:10 am Improved Ant Lion Algorithm for Orderly Charging of Electric Vehicles...648**
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- 10:17 am Hybrid Control Strategy for DAB-LLC Sigma Converter...655**
Zhiwei Chen, Wei Wang, Jie Chen, Qicai Ren, Alian Chen, Tong Liu
- 10:24 am Simplified Current Tracking Strategy for LCL-Based Rectifier Under Unbalanced Grid Voltage Condition...660**
Xiang Gao, Jie Chen, Wei Wang, Tong Liu, Alian Chen, Qicai Ren
- 10:31 am A Modified Modular Multilevel Converter with Features of Reduction of Submodule Capacitor Fluctuation and Fault-Tolerant Operation...666**
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- 10:38 am Grid Interactive Smart Inverter with Intrusion Detection Capability...672**
Khaled Rayane, Haitham Abu-Rub, Mohammad Shadmand, Sertac Bayhan, Atallah Benalia
- 10:45 am Parameter Design of Capacitor for Z-source Circuit Breaker Considering the Influence of Line Resistance and Inductance...678**
Yuan Song, Yingting Yu, Shiwen Wang, Yu Lei, Xiong Li
- 10:52 am A Novel Efficient Bidirectional T-source Circuit Breaker for Low Voltage DC Distribution Network...682**
Yuan Song, Yingting Yu, Shiwen Wang, Qinyi Liu, Xiong Li
- 10:59 am Stability Assessment of P ω and PV Droop Controls in Highly Resistive Microgrids using Analytical Impedance Models...687**
Frederik Stallmann, Axel Mertens
- 11:06 am Synchronous Fault Compensator for Voltage Sensor-less Grid-Following Power Converters...695**
Andres Tarraso, Ngoc Bao Lai, Pedro Rodriguez
- 11:13 am An Improved Decentralized Control of Grid-Connected Cascaded Inverters with Different Power Capacities...700**
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- 11:19 am Efficient Management of Energy Storage Systems using Competitive Controller...705**
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- 11:26 am A Simple Impedance Reshaping Method for Stability Enhancement of Grid-Following Inverter Under Weak Grid...708**
Liang Huang, Chao Wu, Dao Zhou, Frede Blaabjerg
- 11:33 am Transient Current Optimal Control of the Hybrid Three Level Dual Active Bridge Converters Based on Triple-Phase-Shifting Control...714**
Chunshui Du, Wenchen Guo, Song Guo, Wenlu Cai, Qiguo Shi
- 11:40 am Three-Dimensional Frequency Thermal Network Model of Reactor Under High Power and High Frequency Square Wave Voltage...722**
Li Shen, Fan Xie, Bo Zhang, Chen Yang
- 11:47 am Voltage Sensitivity Estimation Based on Measurements of Distributed PV Inverters...727**
Robin Strunk, Marcel Sarstedt, Axel Mertens
- 11:54 am Modulated Model Predictive Control With Common Voltage Injection for MMCC-STATCOM Under Unbalanced Load...734**
Li Zhang, Yongfei Li, Xuejiao Pan
- 12:01 pm DCSCF Detection Method of MMC-DC-Grid Based on Statistical Feature and DBN-SOFTMAX...741**
Yuyu Zheng, Meiqin Mao
- Master Stage: 12:15pm – 1:00pm**
- 12:15 pm Awards**
Chair: *Sudip K. Mazumder, University of Illinois at Chicago, USA*
- 1:00 pm End Conference**