

# Annual Conference of the IEEE Industrial Electronics Society (IECON 2021)

## Special Session on

## “Power Quality’s Impact on Reliability of Power Electronic Systems”

### Organized by

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## Call for Papers

### Theme:

Recent technological revolution in power electronics fuelled the development of grid connected renewable energy systems and smart industrial loads. Penetration of such power electronics load is increasing in low and medium voltage distribution networks. These modern power electronics loads are very sensitive to power quality disturbances in terms of operating performance, reliability, and lifetime of different components. To estimate the effect of different power quality disturbances on active switching devices and passive components, it is important to understand the component level reliability physics, which require a multi-physics modelling of power components. Furthermore, the power quality indices defined in relevant standards are not the right indicator to access the reliability of power components. New reliability indices are required to estimate the effect of power quality disturbances on power electronic systems and possible solutions to improve the reliability. This special session will present the state-of-the-art research outcomes in the area of power quality’s impact on power electronics reliability.

### Topics of interest include, but are not limited to:

- Failure mechanisms of power electronic system in presence of power quality disturbances
- New reliability indices to estimate the reliability of power electronic systems
- Multi-physics modelling of passive components (power loss, thermal stress, parasitic parameters, multi-domain simulations, etc.)

- Application-oriented characterization and degradation testing of passive components
- Life-cycle performance optimization of passive components
- High-performance high-frequency passive components matched for wide bandgap device applications
- Condition monitoring of passive components

**The Sponsoring IES Technical Committee:** Power Electronics (PETC), Renewable Energy Systems

**Submissions Procedure:** All the instructions for paper submission are included in the conference website: <https://attend.ieee.org/iecon-2021/>

### Deadlines:

Full paper submission: June 25, 2021  
 Paper acceptance notification: July 30, 2021  
 Camera-ready paper submission: Aug. 27, 2021

### Reviewers

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## Organizers background:

**Dinesh Kumar** (S'08-M'12-SM'20) received Master of Technology (M. Tech) in power system engineering from Indian Institute of Technology (IIT), Roorkee, India, in 2004, and Ph.D. degree in power electronics from the University of Nottingham, U.K., in 2010. From 2004-2005, he served as a Lecturer in Electrical Engineering Department at National Institute of Technology, Kurukshetra, India. In 2006, he joined Technical University Chemnitz, Germany as a Research Fellow in Power Electronics. From 2006 to 2010, he investigated and developed matrix converter based multidrive system for aerospace applications. Since 2011, he is with the Danfoss Drives A/S, Denmark, where he is involved in many research and industrial projects. He is a member of the IEC standardization Working Group in TC77A and SyC LVDC committee. His current research interests include motor drive, harmonic analysis and mitigation techniques, power quality and electromagnetic interference in power electronics. He is the Editor-in-Chief of International Journal of Power Electronics and the Associate Editor of IEEE Transaction on Industry Applications, IEEE Access Journal, and member of IEEE Transportation Electrification eNewsletter.

**Huai Wang** is currently Professor at the Department of Energy Technology at Aalborg University, Denmark, where he leads the Reliability of Power Electronic Converters Group. His research addresses the fundamental challenges in modeling and validation of power electronic component failure mechanisms, and application issues in system-level predictability, condition monitoring, circuit architecture, and robustness design. He has contributed more than 120 journal papers and co-edited a book on the Reliability of Power Electronic Converter Systems in 2015. He has given 25 tutorials at leading power electronics conferences (e.g., PCIM Europe, APEC, ECCE, etc.) and more than 80 invited talks. Dr. Wang received his PhD degree from the City University of Hong Kong, Hong Kong, China, and B. E. degree from the Huazhong University of Science and Technology, Wuhan, China. He was a short-term visiting scientist with the Massachusetts Institute of Technology (MIT), USA, and ETH Zurich, Switzerland. He was with the ABB Corporate Research Center, Baden, Switzerland, in 2009. Dr. Wang received the Richard M. Bass Outstanding Young Power Electronics Engineer Award from the IEEE Power Electronics Society in 2016 for the contribution to reliability of power electronic converter systems. He serves as General Chair of IEEE IFEC 2020 and Associate Editor of IEEE Transactions on Power Electronics.