

Circuit Breaker Technologies for Direct Current Power Systems

Abstract – With the growing demand of utilizing distributed energy resources and the need for dynamic and reconfigurable power grids with ever increasing power densities, the concept of direct current (DC) power systems is gaining traction. Lower losses and higher power densities enabled by DC power transmission and distribution has sparked the implementation of high voltage DC transmission systems as well as medium voltage distribution systems. A reliable and efficient DC circuit breaker is needed to realize resilient DC grids. The speaker is leading a research project, sponsored by the Advanced Research Projects Agency–Energy, to design, build, test, and commercialize a DC circuit breaker within three years. This fast-paced, high-risk project is built around a team of researchers from the Georgia Institute of Technology and Florida State University, who brought together four key innovations that form the foundation of a new type of hybrid circuit breaker..

Biography – Dr. Lukas Graber is Assistant Professor at the Georgia Institute of Technology. He received his diploma and doctorate degrees in electrical engineering from ETH Zurich in 2002 and 2009 respectively. His Ph.D. research focused on SF6 leakage detection in high voltage gas insulated switchgear. Before he joined Georgia Tech in 2015, he worked at the Center for Advanced Power System, Florida State University – initially as a post-doctoral research associate and later as a research faculty member. His focus was on superconducting power cables and fault current limiters, ultra-fast mechanical switchgear, short circuit forces in substations, and grounding aspects of power distribution on future all-electric Navy ships.



He authored and coauthored more than eighty peer-reviewed publications in journals, magazines, and conference proceedings of the Institute of Electrical and Electronics Engineers (IEEE), the Institute of Physics (IOP), the American Institute of Physics (AIP) among others, and holds nine patents. He is a senior member of IEEE, member of the Conseil International des Grands Réseaux Électriques (CIGRE), member of the Cryogenic Society of America (CSA), and member of Electrosuisse. He serves on the Board of Directors for CSA, serves as an editor for select issues of the IEEE Transactions on Applied Superconductivity, and contributes to standard committees, taskforces, as well as study committees within IEEE and CIGRE.

The lecture is open to the public. The event takes place within the scope of the Swiss Chapter of IEEE Power Electronics Society, <https://www.ieee.ch/chapters/pel/>