

Advanced Multilevel Converters in Smart Grid Applications

Date: Tue. 25th Feb.

Time: 1:10 pm

Location: Building 59, Room 2016

Speaker:

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Abstract:

Smart Grid is considered one of the essential topics in electrical power research. Electronic power conditioning and control of the production and distribution of electricity are important aspects of the smart grid. According to the contribution of renewable energy sources in smart grids, design of smart grids aims to enable the bidirectional power and communication flow through distribution and transmission networks. This aspect requires including of smart power electronic converters, which are expected to contribute by 70-80 % of the overall smart grid components.

Power electronic multilevel converters (MLCs) are preferred over conventional converters thanks to their higher power quality. Recently, advanced topologies have been developed to mitigate the complexity in both power and control circuits of MLCs. Among of these advanced ones is the T-type MLC. This seminar will focus on the development in advanced T-type MLC topologies and their applications in smart grids. The discussion will cover the most recent applications, the converter design and control with more focus on electrical drives based model predictive control approaches. On the other hand, the discussion will elaborate KFUPM facilities for power electronic converters design, fabrication, testing and evaluation.

Bio:

Dr. Aboubakr Salem received the B.Sc. and M.Sc. degrees in electrical engineering from Helwan University, Egypt, in 2004 and 2009, respectively. He received his Ph.D from Ghent University, Belgium in 2015. He is currently working as Visiting Assistant Professor at EE Dept., King Fahd University for Petroleum and Minerals. He is involved in several funded projects from KFUPM as PI and Co-I. He has participated as a Co-I in funded projects from European Union (i.e. STS-Med and Euro-Sun-Med) with a fund of € 20 million. His research interests include power electronic converters design and control, electrical drives applications, renewable energy integration, electrical vehicles and smart grid applications.