

Tutorial SESSION

Tutorial Session on “Fuel Cell Technology for Transport applications”



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ORGANIZED by

Dr. Elena Breaz, University of Technology of Belfort-Montbéliard, France

elena.breaz@utbm.fr

Prof. Fei Gao, University of Technology of Belfort-Montbéliard, France

fei.gao@utbm.fr

TUTORIAL SESSION DESCRIPTION

Fuel cell is a potential candidate for energy storage and conversion in our future energy mix, which is able to directly convert the chemical energy stored in fuel into electricity. Among the different fuel cell types, proton exchange membrane (PEM) fuel cell is considered one of the potential embarked energy candidates for future transportation.

This lecture will mainly focus on PEM fuel cell technology which is mainly used in transport applications. The PEM fuel cell fundamentals, such as its physics, structure, power characteristics, efficiency, will be presented and discussed. The fuel cell system with its key ancillary components, such as air compressor, hydrogen tank, power converter, will also be introduced. Different powertrain configurations with fuel cells in transport applications will be discussed and shown with real examples around the world. An emphasis on the fuel cell economic aspects and a short introduction to hydrogen economy will be given at last.

WHAT IS COVERED

- Fuel cell fundamentals
- Fuel cell system ancillaries
- Fuel cell powertrains
- Introduction to hydrogen economy

SHORT BIO OF ORGANIZERS

Dr. Elena Breaz is currently an associate professor at the University of Technology of Belfort-Montbéliard (UTBM), Belfort, France. She received the Master degree in electrical engineering from Technical University of Cluj-Napoca in 2009 and the PhD degree in engineering science in 2012 from the same university in Romania. Her main research areas include fuel cell modeling, electric hybrid vehicle design and real time simulation technology for energy systems. Since 2012, she is also a faculty member of the electrical engineering department of Technical University of Cluj-Napoca.

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Prof. Fei Gao received the Master's degree in electrical and control system engineering in 2007, and the Ph.D. degree in renewable energy with distinguished Youth Doctor Award in 2010, both from the University of Technology of Belfort-Montbéliard (UTBM), Belfort, France. He is currently a Full Professor at the School of Energy and Computer science of UTBM, where he was an Associate Professor between 2011 and 2017. Prof. Gao is the Fellow of IET and the holder of the French research expertise bonus (PEDR) by the French Ministry of Higher Education and Research. He is also the Editor-in-Chief (2019-2021) of IEEE Industrial Electronics Technology News, and an Associate Editor of IEEE Transactions on Industrial Electronics, IEEE Transactions on Industry Applications, IEEE Transactions on Transportation Electrification and IEEE Open Journal of Industrial Electronics Society, and the Chair of fuel cell system architecture optimization research axis of the national Fuel Cell Research Federation FCLAB in France. He is nominated in 2017 as Conferences/Workshops Committee Chair of IEEE Transportation Electrification Community. He serves since 2018 as Chair of the Technical Committee on Transportation Electrification of the IEEE Industry Electronic Society and serves since 2019 as Secretary of the Technical Committee on Vehicle and Transportation Systems of IEEE Power Electronics Society.

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