

Organisational Information

Sign up at: www.ecpe.org/events

Registration Deadline:

- **6 February 2019**

Participation Fee:

- **€ 595,-** for industry
 - **€ 445,-** for universities/institutes
 - **€ 200,-** for students/PhD students (limited spaces; copy of students ID required)
-
- The regular participation fee includes dinner, lunches, coffee/soft drinks and a flash drive with presentations.
 - Upon receipt of registration confirmation via email you are signed-up for the event. The invoice will be sent via letter post.
 - Three participants from each ECPE member company free of charge. Allocation in sequence of registration.
 - Further information (hotel list and maps) will be provided after registration and can be found on the ECPE web page.
 - Cancellation policy: Full amount will be refunded in case of cancellation upon to 2 weeks prior to the event. After this date and in case of no-show 50 % of the fee is non-refundable (replacement is possible).

05/02/19

Organisational Information

Organiser ECPE e.V.
90443 Nuremberg, Germany
www.ecpe.org

Chairmen Prof. Drazen Dujic
EPFL Lausanne, Switzerland
Prof. Johann W. Kolar
ETH Zürich, Switzerland

Organisation Lena Somschor, ECPE e.V.
+49 911 81 02 88 – 18
lena.somschor@ecpe.org

Venue Starling Hotel Lausanne
Route cantonale 31
CH-1025 Saint-Sulpice
Switzerland

+41 (21) 694 85 85
contact@shlausanne.ch
www.starling-hotel-lausanne.com



Source: Starling Hotel



European Center for
Power Electronics e.V.

ECPE Workshop

New Technologies for Medium-Frequency Solid-State Transformers

14 - 15 February 2019
Starling Hotel
Lausanne
Switzerland



in cooperation with

ETH zürich

EPFL
ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE



ECPE Workshop

New Technologies for Medium-Frequency Solid-State Transformers

14 - 15 February 2019
Lausanne, Switzerland

Solid-state transformers are nowadays a highly attractive research topic, both in academia and industry. Various topological proposals have been made and several demonstrators have already been deployed. A solid-state transformer is a galvanically isolated converter with power electronics interfaces on its terminals and isolation achieved at arbitrary high operating frequency of an integrated medium/high-frequency transformer. Since at least one of the terminals is intended for direct MV connection, this brings many technological challenges related to implementation of modular power electronics stages, insulation and overall system integration besides the application of high switching speed medium voltage power semiconductors and new measurement technologies required for performance evaluation. The workshop focus will be on the key technologies needed to further advance solid state transformers concepts:

- MV Transformers: magnetic materials, winding technologies, modeling, insulation coordination, design optimization
- Power Semiconductors: Wide-band gap devices, high frequency switching, soft switching techniques, packaging and integration
- System Integration: Advanced designs of PEBBs, CELLS, sub-assemblies for solid-state transformers
- Measurement Techniques: Soft-Switching and on-state loss measurement of MV power semiconductors, loss measurement of passive components, characterization of insulation materials.

The workshop is chaired by

Prof. Drazen Dujic, EPFL (Switzerland)
Prof. Johann W. Kolar, ETH Zürich (Switzerland)

All presentations and discussions will be in English.

Programme

Thursday, 14 February 2019

09:00 Start of Registration / Welcome Coffee

09:30 Welcome, Opening
Andreja Rojko, ECPE (D)

Introduction

09:40 High-Power Medium-Voltage Medium Frequency Transformer Design Challenges
Drazen Dujic, EPFL (CH)

10:20 Topologies and Potential Future Applications of Solid-State Transformers
Johann Kolar, ETH Zürich (CH)

11:10 Coffee Break

Medium Voltage Transformers: Challenges and Design

11:30 Design Optimization of Medium Frequency Transformers for High Power Medium Voltage Appl.
Marko Mogorovic, EPFL (CH)

12:00 Challenges in the Design of Medium-Frequency Transformers for High-Power Applications
Thomas Gradinger, ABB Switzerland (CH)

12:30 Design Flow Methodology and Characterization for High Voltage Medium Frequency Power Transformers
Bruno Lefebvre, Supergrid Institute (F)

13:00 Lunch

Power Semiconductors for SST

14:00 High Power Semiconductors for Medium to High Frequency Resonant Converters
Munaf Rahimo, MTAL (CH)

14:30 Application of HV SiC-Devices and Their Challenges
Dirk Kranzer, Fraunhofer ISE (D)

15:00 Medium-Voltage Medium-Frequency Transformers for DC Grids
Björn Riemer, Schaffner Power Magnetics (D)

15:30 Coffee Break

Applications: Wind

16:00 The Solid State Transformer - An Essential Device in the Evolution of DC Railway Electrification Systems
Phillipe Ladoux, University Toulouse (F)

16:30 Medium and High Voltage DC-DC Converters Intended for Offshore Wind Farms
Takushi Jimichi, Mitsubishi Electric (JPN)

17:00 Discussion

17:15 End of 1st Workshop Day

Additional Programme

17:30 Visit to EPFL (1 h duration, Pre-registration necessary)

19:30 Dinner at "Le Theatre Restaurant"

Programme

Friday, 15 February 2019

08:30 Start of 2nd Workshop Day

System Integration

08:30 MF DC/DC Converter for Traction Battery Applications
Milos Stojadinovic, ETH Zürich (CH)
Tiago Nabais-Lima, Bombardier Transportation (CH)

09:15 Design Criteria for Medium-Frequency Power Transformers from Low to Medium-Power Applications
Immar Villar, IKERLAN (ES)

09:45 Dielectric Losses in the Insulation of Dry-Type Medium-Frequency Transformers
Thomas Guillod, ETH Zürich (CH)

10:15 Coffee Break

Materials, Magnetics and Measurements

10:45 Grain Oriented SiFe Materials
Thierry Belgrand, Thyssenkrupp Electric Steel (F)

11:15 Soft Magnetic Material for Medium Frequency Transformer
Hirohiko Miki, Hitachi Metals Ltd (JPN)

11:45 How to Avoid Inconvenient Characteristics of HF Litz Wire
Dietmar Exner, Pack LitzWire (D)
Hans Roßmanith, University Erlangen-Nuremberg (D)

Special Topics / Applications

12:30 Protection Concepts for Hybrid Transformers in the Distribution Grid
Johannes Burkard, ETH Zürich (CH)

13:00 Lunch

13:45 High-Voltage Generators for Medical X-ray Imaging Systems: State of the Art and Technology Trends
Stéphane Gautrais, GE HEALTHCARE (F)

14:15 Challenge and Interest of e-Transformer for Railway Traction System
Rockys Akli, Alstom (F)

14:45 Modeling the Core Material Characteristic of Medium Frequency Transformers in System Level Simulations
Min Luo, Plexim (CH)

15:15 MF Transformer-based Series-resonant Converter for DC Wind Turbine
Philip Carne Kjær, Vestas Wind Systems (DK)

15:45 End of Workshop