

6th mobileM Colloquium

November 5th - 6th, 2019

RWTH Aachen University, Germany



6th mobileM Colloquium

November 5th - 6th, 2019

The challenge to drastically reduce worldwide greenhouse gas emissions despite growing energy demand requires decisive changes in energy supply, conversion and storage technologies. For the transport sector the electrification of the drivetrain combined with increasing electrical power generation from renewable sources is a promising approach to decrease the dependency on shortening crude oil and gas resources.

6th mobileM Colloquium

The 6th mobileM Colloquium is a discussion panel for young researchers and professionals covering the areas of electrical energy storage, electrical drive systems, system simulation and control, topology and thermal management as well as range extender modules.

Research Training Group mobileM

mobileM (Integrated Energy Supply Modules for Roadbound E-Mobility) is a Research Training Group of RWTH Aachen University funded by Deutsche Forschungsgemeinschaft (DFG). It explores the physical foundations of electro-chemical energy storage for mobile propulsion and its combination with novel fuel-operated range extender units.



Presentation Program

Tuesday, November 5th, 2019

Welcome and Opening

10:30 Opening Address
Prof. Stefan Pischinger, VKA of RWTH Aachen University

Simulation & Control

Session Chair: Prof. Dirk Abel, irt of RWTH Aachen University

- 10:45** Innovative Mechanical Components for Electric Traction Drives
Jochen Wolf, Muhr und Bender KG
- 11:15** Integrity and Collaboration in Dynamic Sensor Networks: Results from the DFG research Training Group I.C.Sens
Prof. Steffen Schön, Leibniz Universität Hannover
- 11:45** Experimental Investigations of 3D Anisotropic Mass Transfer Properties of Gas Diffusion Layers for Polymer Electrolyte Membrane Fuel Cells
Stephan Martin, LET of Universität Duisburg-Essen
- 12:15** Hierarchical Model Predictive Control of a Fuel Cell Hybrid Vehicle
Verena Neisen, irt of RWTH Aachen University
- 12:45** Lunch Break

Poster Session

Tuesday, November 5th, 2019

13:15 Poster Presentations

14:15 Poster Session in the Foyer

Power Electronics

An Energy Management Strategy for Fuel Cell Hybrid Train
K. Deng, IEM of RWTH Aachen University

Intelligent Gate Drivers for Ultra Compact SiC Inverters
M. Laumen, ISEA of RWTH Aachen University

Comparison of High Performance Cooling Concepts for SiC Power Modules
A. Sewergin, ISEA of RWTH Aachen University

Application-Specific Power Electronic Module for Highly-Integrated DC-DC-Converter
A. Stippich, ISEA of RWTH Aachen University

Energy Storage

Strange Gauge as Forecasting Method of the Cell Death
L. Willenberg, ISEA of RWTH Aachen University

In situ TEM Analyses of Cathode Materials in Lithium-Ion Batteries
S. Jakobi, AC of RWTH Aachen University

Energy Efficiency Comparison: Green Ammonia and Hydrogen as a Fuel
F. Nigbur, LET of Universität Duisburg-Essen

Combustion Engines

Engine-Out Gas-Emission Simulation of Spark-Ignition Engines in Electrified Powertrains
S. Esposito, VKA of RWTH Aachen University

Large-Eddy Simulations of Combustion and Pollutant Formation in Compression Ignition Engines
M. Davidovic, ITV of RWTH Aachen University

AutoDiagnosis: Automatic Data-Driven Configuration of an Automotive Fault Diagnosis Algorithm Using Noisy Two-Stage Optimization
D. Stenger, irt of RWTH Aachen University

Simulation & Control

Scenario-Based Testing of Connected Driving Functions
D. Raudszus, ika of RWTH Aachen University

Cooling of Power Electronics with Impinging Jets
E. Sabelberg, WSA of RWTH Aachen University

Modeling and Simulation of Drive Train Acoustics
M. Jaeger, IEM of RWTH Aachen University

Presentation Program

Tuesday, November 5th, 2019

Electrical Energy Storage

Session Chair: Prof. Dirk Uwe Sauer, ISEA of RWTH Aachen University

- 15:15 Energy Storage beyond Lithium
Prof. Hans Jürgen Seifert, Karlsruhe Institute of Technology
- 15:45 Approaching the nm Scale in the Electrical Characterization
of Battery Materials
Prof. Ulrich Simon, IAC of RWTH Aachen University
- 16:15 Mechanics in Silicon-Graphite Anodes
Fabian Frie, ISEA-ESS of RWTH Aachen University
- 16:45 Air Electrode Design for Lithium-Oxygen Batteries
Philipp Wunderlich, IAC of RWTH Aachen University
- 20:00 Dinner
Restaurant „Karl's Wirtshaus“
Markt 17-21, 52062 Aachen

Presentation Program

Wednesday, November 6th, 2019

Electrical Drive System

Session Chair: Prof. Kay Hameyer, IEM of RWTH Aachen University

- 08:30 Audi e-tron – The Way to Emissionfree Mobility
Andreas Ruf, AUDI AG
- 09:00 Wide-Bandgap Materials – The Next Generation of Power Electronics
for Propulsion Systems?
Prof. Rik W. De Doncker, ISEA-LEA of RWTH Aachen University
- 09:30 Development of a GaN-based Full-Bridge Converter with
Digitally Adjustable Voltage Slopes
Vivien Grau, ISEA-LEA of RWTH Aachen University
- 10:00 Thermal Hardware-in-the-Loop Tests for Electric Traction Drive
Konstantin Etzold, VKA of RWTH Aachen University
- 10:30 Coffee Break

Topology & Thermal Management

Session Chair: Prof. Stefan Pischinger, VKA of RWTH Aachen University

- 11:00 E-Mobility: Silent, but not Boring
Karsten Mausolf, Volkswagen AG
- 11:30 Measurement of Temperature Fields inside Small Droplets:
Approach and Related Challenges
Prof. Reinhold Kneer, WSA of RWTH Aachen University



Presentation Program

Wednesday, November 6th, 2019



- 12:00** Consideration of Local Conditions for Thermal Comfort Simulations
Damian Backes, ika of RWTH Aachen University
- 12:30** Optimized Cooling Strategies for Electric Drivetrain Components
Carsten Wulff, VKA of RWTH Aachen University
- 13:00** Lunch Break

Range Extender Module

Session Chair: Prof. Angelika Heinzl, LET of Universität Duisburg-Essen

- 13:45** Honda Fuel Cell Vehicle Development and towards the Hydrogen Society
Takashi Moriya, Honda R&D Co., Ltd., Automobile R&D Center
- 14:15** Advanced Numerical Simulations of High-Efficiency Spark-Ignition Engines
Prof. Heinz Pitsch, ITV of RWTH Aachen University
- 14:45** Fuel Cell System Simulation – Membrane Water Management
Sören Tinz, VKA of RWTH Aachen University
- 15:15** An Optimized Laminar Burning Velocity Scheme for Very Lean High
EGR SI-Engine Burning Concepts
Raik Hesse, ITV of RWTH Aachen University
- 15:45** Concluding Remarks
Prof. Stefan Pischinger, VKA of RWTH Aachen University