

TECHNICAL PRESENTATION PROGRAM

PRELIMINARY



EUROGRESS AACHEN,

GERMANY

OCTOBER 7th-9th, 2024

33

AACHEN
COLLOQUIUM

SUSTAINABLE MOBILITY

Conference Agenda

Europa

Berlin

Lissabon

Brüssel

K1 Aachen

Monday, October 7th, 2024

18:00 Lobby: Welcome Reception & Opening of the Technical Exhibition

Tuesday, October 8th, 2024

08:30 Opening Plenary Session

10:30 Break

11:00	Fuel Cells I	Strategy I	Battery Systems I	ADAS / AD	Trends for Combustion Engines
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12:30 Lunch Break

14:00	Fuel Cells II	Strategy II	Battery Systems II	Software Defined Vehicles	V2X and Powertrain Solutions
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16:00 Break

16:30	Thermal Management	Strategy III	Battery Systems III	User Experience	FVV
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Wednesday, October 9th, 2024

08:30	H2-ICE I	Sustainability I	ePowertrain I	LiDAR Testing	Chassis - Heavy Duty
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10:00 Break

10:30	H2-ICE II	Power Electronics	ePowertrain II	Verification and Validation	Chassis - Vehicle Dynamics
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12:30 Lunch Break

14:00	H2-ICE III - Emissions	Sustainability II	Electric Drive Systems	Simulation Methods	Chassis - Emissions
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15:30 Break

15:40 Closing Plenary Session

Opening plenary session in the Europa Hall



08:30 Welcome



Univ.-Prof. Dr. rer. nat. Dr. h.c. mult.

Ulrich Rüdiger

Rector, RWTH Aachen University

Introduction to the 33rd Aachen Colloquium

Univ.-Prof. Dr.-Ing.

Lutz Eckstein

Institute Director, ika, RWTH Aachen University

Univ.-Prof. Dr.-Ing.

Stefan Pischinger

Institute Director, TME, RWTH Aachen University



08:40 Plenary speakers

Dr. Sabine Klauke

CTO, Airbus

Dr. Holger Klein

CEO, ZF Group

Shunichi Inamijima

Corporate Vice President, Nissan

Ruiping Wang

CEO, Aurobay

10:00 Plenary discussion

Technical Presentations Program Tuesday, October 8th, 2024 Session 1

	Fuel Cells I	Strategy I	Battery Systems I	ADAS/AD	Trends for Combustion Engines
	Europa	Berlin	Lissabon	Brüssel	K1 Aachen
11:00	<p>Next Gen fuel stack module for HD applications, a one stack-one system approach</p> <p>J. Kraft, A. M. Damjanovic, M. Eckardt, N. Zsiga - EKPO Fuel Cell Technologie</p>	<p>Mastering the perfect strom - How supplier create profitable business models for 2030</p> <p>C. Koehler - H&Z Group</p>	<p>Development, optimization, testing, and prototype production of cylindrical lithium-ion cells</p> <p>K. Brandt - EAS Battery Systems</p>	<p>Data from Space: Opportunities and Challenges for Copernicus in Mobility</p> <p>J. Hiller, F. Cziudai-Sonntag - BAST Bundesanstalt für Straßenwesen</p>	<p>Contributing to the Environment with Internal Combustion Engines towards Carbon Neutrality – Research for a new direction</p> <p>H. Yamashita, D. Shimo, H. Hidaka, T. Yamamoto - Mazda Motor Corporation</p>
11:30	<p>MAHLE Fuel Cell Components in the System</p> <p>D. Rieger, M. Auer - MAHLE International GmbH</p>	<p>Supplier financial transformation</p> <p>J. Berking, M. Majic, J. Giebels, S. Schnurrer - Oliver Wyman GmbH</p>	<p>Global battery development & production network of Mercedes-Benz</p> <p>U. Keller - Mercedes-Benz AG</p>	<p>Using Scenarios for Data-Driven Assessment of Automated Driving Systems</p> <p>C. Glasmacher, A. Klöker, L. Vater, L. Eckstein - ika, RWTH Aachen University</p>	<p>Development of high thermal efficiency methanol engine</p> <p>H. Wei - Aurobay</p>
12:00	<p>Opportunities to enhance the performance of fuel cell systems</p> <p>M. Walters, S. Lauer, A. Schlosshauer, M. Mally, M. Schmitz, M. Thewes - FEV</p>	<p>Mega Casting - Business case opportunities and threads along the value chain</p> <p>C. Harter - fka GmbH A. Klos - Tsetinis Consulting Deutschland GmbH</p>	<p>Electric Maserati - challenges and sports car-specific solutions for charging and battery systems</p> <p>M. Boeckl - STELLANTIS S. Zin - Maserati M. Rudolph, M. Stapelbroek - FEV</p>	<p>Cooperative ADAS-Functions with V2X Communication</p> <p>M. Kremer, S. Christiaens, C. Granrath - FEV.io GmbH</p>	<p>PHINIA 500bar Gasoline direct injection (GDi) system from development to serial production</p> <p>B. Gomot, W. Piock, G. Dober, L. Zhou, O. Trotignon, N. Cezon - PHINIA</p>

Technical Presentations Program Tuesday, October 8th, 2024 Session 2

Fuel Cells II

Strategy II

Battery Systems II

Software Defined Vehicles

V2X and Powertrain Solutions

Europa

Berlin

Lissabon

Brüssel

K1 Aachen

Industrialization of Fuel Cell for Heavy Duty Long-Haul Applications

L. Johansson - cellcentric GmbH & Co.KG

Global Powertrain Outlook - Road to Net Zero

W. Hossenally - S&P Global

A novel and versatile test bench for safety testing of lithium-ion cells

S. Beschmitt, C. Herget, H. Löbberding, A. Averberg, M. Rudolph, M. Stapelbroek - FEV

Principles and Use-Cases of the Live Digital Twin of Traffic in the AUTotech.agil Project

F. Thomsen, R. van Kempen, L. Zanger, B. Lampe, T. Woopen, L. Eckstein - ika, RWTH Aachen University

Approach towards efficient vehicle energy management

R. Puts, S. Visser, B. van Moergastel, K. Norgel, B. Aust - DENSO Automotive

Application-specific Component Dimensioning for HeavyDuty Fuel Cell Trucks based on real Driving Data

M. Pietruck, L. Eckstein, A. Rozum, G. Witham - ika, RWTH Aachen University

Driving the CO2 footprint of the global ICE car park down to zero emissions in one generation

B. Middendorf, B. Lorentz, S. Pfeifle, H. Proff - Deloitte Consulting GmbH

The vital role of digitalisation and BMS in transitioning to e-mobility

M. van Schijndel-de Nooij, T. Donkers, H. J. Bergveld, M. Sheikh - Eindhoven University of Technology

Navigating the Shift: Principles and Challenges of Software-Defined Vehicles

W. Said, R. Biurrun - Porsche Consulting GmbH

Field test data based electrification of commercial vehicle fleets

J. Bahlmann, O. Voßen - fka GmbH

Driving Towards a Zero-emission Future: The Latest Generation Fuel Cells and their Role in Heavy-Duty Mobility

B. Oz - Ballard Power Systems

VW Group – Strategic technology approach for enabling affordable EVs

A. Perner, M. Hollweg - Volkswagen AG

Next-gen battery strategies 2027+: Potentials & challenges for future battery designs & diversity of product portfolios

I. Miller, B. Satvat, M. Schäfer - P3 group GmbH

tbd
tbd - IVECO

Nissan's Strategy and Technologies for V2X (Vehicle-toHome/Grid)

M. Kubo - Nissan Motor Co., Ltd.

The fuel cell propulsion system of the Stellantis large vans

M. Alt, T. Hahne, C. Tonelli, C. Wieser - Stellantis

Battery cost as existential challenge to automotive OEMs

D. Gallus, W. Bernhart, C. Simon-Ernst, F. Eilers - Roland Berger GmbH

48V mHEV batteries – Motivation and example for a P2 application

H. Mettlach - Stellantis/Opel Automotive

Leveraging Generative-AI in Software-Defined Vehicles

J. Richenhagen, B. Mrohs, S. Kriebel - FEV.io
G. Laoutoumai - FEV
M. Engelhard - FEV Consulting

Advancing Urban Electric Vehicles: Powertrain Innovations for Enhanced NVH Performance

P. Kauffmann - Johnson Electric

Technical Presentations Program Tuesday, October 8th, 2024 Session 3

	Thermal Management	Strategy III	Battery Systems III	User Experience	FW
	Europa	Berlin	Lissabon	Brüssel	K1 Aachen
16:30	<p>Data-driven simulation approach for the thermal management of battery electric vehicles</p> <p>S. Pfund, F. Döring, T. Fiala - BMW Group J. Köhler, N. Lemke - Technische Universität Braunschweig</p>	<p>Systems Engineering is a must in Automotive to secure competitiveness and time to market</p> <p>C. Foltz, H. Güthner, T. Schadt - PwC Strategy& (Germany) GmbH</p>	<p>UNI Technology: Unrivalled flexibility and scalability</p> <p>M. Totman, I. Babić, D. Cindrić, R. Merz - Rimac Technology</p>	<p>ZF Eco Control 4 ACC - sustainable way to increased comfort</p> <p>T. Wehlen, M. Arzner - ZF Friedrichshafen AG</p>	<p>TWC Reaction under High-frequency Lambda Switching</p> <p>tbd- KIT/Waseda</p>
17:00	<p>Identification of Relevant Thermal System Design Scenarios for Scenario-Based Development</p> <p>P. Muhl - Porsche AG</p>	<p>The odds of outperforming central product architectures with capable development systems</p> <p>U. Guddat, M. Hart, S. Langkau - Strategy Engineers</p>	<p>Optimizing battery range & thermal comfort for Battery Electric Vehicles (BEVs) with CFD & System Model Co-Simulation</p> <p>R. Dontham, C. Luzzato - Dassault Systèmes Germany; V. Nagarajan, C.-W. Chang, H. Li - Dassault Systèmes United States A. Colleoni - Dassault Systèmes France</p>	<p>The Role of Human Factors in Current and Future European Whole Vehicle Type Approval</p> <p>E. Schmidt, T. Wexel, R. Gerlach - TÜV Rheinland</p>	<p>The Generic Stack - A platform for Testing and System R&D</p> <p>J. Scholta, F. Häußler, M. Hölzle, L. Jörissen - ZSW</p>
17:30	<p>A comprehensive approach for Integrated Thermal Management Module development</p> <p>A. Savi - Saleri TMS Competence Center GmbH</p>	<p>Strategies for EV Power Electronics: Balancing Performance, Profitability and Sustainability</p> <p>N. Almohammed, K. Krüger, B. Knobloch, H. Wegener - FEV Consulting</p>	<p>tbd tbd - CATL</p>	<p>From a means of transport to a health product</p> <p>M. Dittrich - CARIAD SE</p>	<p>Benchmark Platform for Scale Resolving Simulations</p> <p>tbd - Uni Stuttgart/Empa</p>

Technical Presentations Program Wednesday, October 9th, 2024 Session 1

H2-ICE I

Sustainability I

ePowertrain I

LiDAR Testing

Chassis - Heavy Duty

Europa

Berlin

Lissabon

Brüssel

K1 Aachen

Simulation-based development of engine management and thermodynamics of the Deutz TCG 7.8 H2

B. Nork, A. Qriqra - DEUTZ AG

Modeling Potential CO₂ Reductions Using Heavy-light-duty and Medium-duty Range-extended Electric Trucks

J. McDonald, B. Ellies - U.S. EPA; P. Bhagdikar, S. Bhattacharjya, P. Chambon, G. Conway, K. Hoag, R. Mitchell, T. Reinhart, K. Whitney - Southwest Research Institute; S. Ahmed, K. Knehr, J. Kubal - Argonne National Laboratory

Thermal simulation to reduce heat loss of the CCS charging inlet of electric vehicles at high charging currents

J. Krings, P. Ziegler, P. Steinmetz - Daimler Truck AG
H.-C. Reuss - FKFS Stuttgart

LiDAR technologies: need for harmonised test methods

A. Sakpal - fka GmbH

Linear Guidance with Camber Compensation (LinCC) – An independent suspension solution designed for longhaul heavy-duty

K. Hergenröther, L. Eckstein - ika, RWTH Aachen University

Retrofitability Potential of an Off-Road Diesel Engine for DI Hydrogen Operation: Experimental and Numerical Study

F. Millo, A. Scalambro, A. Piano - Politecnico di Torino
F. Mallamo, R. Loiodice, B. Jagodzinski, A. Dhongde - FEV
N. Scinicariello, W. Lodi - Kohler

A Study on LCA Environmental Impact of Passenger Car by Power Sources : Focusing on the global warming potential

K.J. Hwang, S.J. Hong, S.W. Choi, J.H. Kim, Y.G. Kim, D.N. Moon, J.H. Seo, S.B. Jo - Hyundai Motor Company

RT's Next-Gen E - Axle Platform

V. Bhatia, M. Šramek, A. Martinčić - Rimac Technology

Meeting the future needs of Autonomous Driving with SingleChip FMCW LiDAR Technology

G. Schunk, O. Ramoli - Scantinel Photonics GmbH

A disruptive approach to electromobility for heavy commercial vehicles

J.-C. Ebert - Ebertconsulting GmbH
J. Ebert - Aberg Axles GmbH

Hydrogen Powertrain Solutions for HD-Trucking

S. Buhl, A. Broda, F. Lindner, S. Schraml - MAN Truck & Bus SE

ENERGIZE 2045: Sustainable Energy Imports and Synthetic Fuels - Strategies and Chances

S. Kahlbau, A. Schwindt, L. Yorck von Wartenburg, M. Kittler - C4D GmbH

Enhancing Sustainability and Efficiency in Jaguar Land Rover's Electric Drive Unit Through Advanced Thermal Management

A. Sadrfaridpour, M. Spenley - Jaguar Land Rover

LiDAR for Level 4 Automated Trucks

N. Heußner - Torc Robotics

Vehicle Motion Control on Electric Vehicles – Capabilities on connecting Chassis and Powertrain Features

T. Voßhall, M. Dorn, T. Reckeweg - FEV

Technical Presentations Program Wednesday, October 9th, 2024 Session 2

	H2-ICE II	Power Electronics	ePowertrain II	Verification & Validation	Chassis - Vehicle Dynamics
	Europa	Berlin	Lissabon	Brüssel	K1 Aachen
10:30	<p>Supercharger Boosting on H2 ICE for Heavy Duty application N. Adrisani, B. Nilesh - Eaton srl</p>	<p>2/3-Level SiC/GaN 800 V Power Converter Topologies for High Performance Electric Sportscars T. Velic, L. Heuken - Dr. Ing. h.c. F. Porsche AG N. Parspour - iew, University of Stuttgart</p>	<p>Long Life e-Axle Drive for BEV- and Fuel Cell Applications H. Schneeweiß - eAx solutions GmbH</p>	<p>Scenario.center: providing scenarios for the validation of automated driving systems M. Schuldes, L. Eckstein, C. Glasmacher - ika, RWTH Aachen University</p>	<p>The Influence of Vehicle Electrification on Chassis Design P. Zandbergen</p>
11:00	<p>Hydrogen Combustion Engine for commercial vehicle applications : challenges and solutions for various use cases J. Op de Beek - Opmobility</p>	<p>Evaluation of Multi-Level Inverter Topologies for Electrical Traction Drives A. Wörndle, R. Cremer, P. Bäuerle - FEV M. Ezzine, R. Goswam, P. Igic, W. Jamal, S. Shepherd - Coventry University</p>	<p>Efficient, lightweight, cost-effective: Innovative electric drive unit with dual rotor electric machine and SiC inverter G. Hellenbroich, V. Shapovalov - FEV A. Rosen, V. Berger, Z. Weicherding - DeepDrive GmbH</p>	<p>Research Needs in Teleoperation - An Overview on the Technical Report E. Shi - BAST Bundesanstalt für Straßenwesen</p>	<p>Steer by Wire - Requirement development to enable authentic steering feel and advanced driving stabilization functions J. Schubert - AVL List GmbH</p>
11:30	<p>HyMot: H2 Engine optimized for Light Commercial Vehicle Applications with Near-Zero Emissions K. Audounard, J.-B. Leroy - Robert Bosch France; O. Coureau - Renault Group; G. Aufranc - Forvia; B. Corbières - Alpine; B. Griffaton - TotalEnergies; N. Perrot - Ecole Centrales Nantes; X. Gautrot - IFP Energies Nouvelles; R. Grizivatz - Ose Engineering</p>	<p>1500 V DC ?! - Optimal Voltage Levels for Next Generation E-Mobility C. Danzer, V. Ambrosius, A. Heghmanns, D. Schlabe, A. Hoffmann, H. Georgi, M. Clauss, A. Fandakov, H. Ulmer, H. Rabba, K. Müller, M. Sens - IAV GmbH</p>	<p>Fit for future - the journey towards cleaner and more sustainable mobility solutions K. Kashi, T. Altenrath, C. Gillen - GKN Driveline International</p>	<p>The SUNRISE Project – A Comprehensive Framework for Enhancing Safety Assurance tbd - SUNRISE</p>	<p>The eD1 MINI - A Last-Mile Electric Logistic Vehicle based on Chassis-by-Wire Technology S. Steinwascher - GETEC Getriebe Technik GmbH</p>
12:00	<p>H2-ICE, A route to rapid decarbonisation with air quality co-benefits, for the NRMM sector R. Ballard, T. Beamish - J C Bamford Excavators Ltd</p>	<p>NanoLam DC Link Capacitors for high- efficient Commutation Systems M. Breuer, K. Grimm, M. Glogasa - Rheinmetall Polycharge M. Nuotio - California Tech Center Rheinmetall Automotive</p>	<p>48V Electric Powertrain Development for Toyota's Paris 2024 Olympic and Paralympic Games Accessible People Mover APM A. Mohammadi - Toyota N. Pandey - FEV</p>	<p>Statistical Validation of the BMW Personal Pilot L3 N. Kämpchen - BMW AG</p>	<p>Steer-by-Wire Development Methods and Verification D. Wegener, L. E. Fautz - fka GmbH J. Pelzer, L. Eckstein - ika, RWTH Aachen University</p>

Technical Presentations Program Wednesday, October 9th, 2024 Session 3

H2 ICE III - Emissions

Sustainability II

Electric Drive Systems

Simulation Methods

Chassis - Emissions

Europa

Berlin

Lissabon

Brüssel

K1 Aachen

14:00

Towards zero emissions solution with hydrogen and ammonia combustion engines

B. Seba - Liebherr Machines Bulle SA

eFuels as a Net Zero Enabler: The Way Forward to Create a New Industry

L. Mauler - Porsche Consulting GmbH

MAHLE technology kit for electric traction motors: Shaping the future role of Externally Excited Synchronous Machines

L. Lorenz, H. Oechslen, C. Uibelesen
- MAHLE International GmbH

Verification & Validation approach for Dynamic Driving Simulators towards a Human-Centered Safety Assurance Process

F. Russ, L. Eckstein
- ika, RWTH Aachen University

Non-exhaust emissions: Challenges from an overall system development perspective

S. Ott, A. Albers, M. Fischer, L. Jedelsky
- Institut für Produktentwicklung, KIT
P. Bühler, E.-M. Knoch, F. Gauterin
- Institut für Fahrzeugsystemtechnik, KIT

14:30

Aftertreatment of H₂ engine: a novel approach focusing on the specific attributes of the H₂ engine and cost optimisation

E. Georgiadis, J. E. Bebe, M. Pfeifer, T. Wolff
- Dinex

The flexible use of renewable fuels in non-road applications

P. Moore, P. Muller, V. Page - Caterpillar Inc
A. Arnberger - AVL Liste GmbH

Togg at scale: #ReDefineMobility

G. M. Karakaş - Togg

Novel method for the quantification of subjective full vehicle ride comfort phenomena on a Dynamic Driving Simulator

S. Strößer, A. Wagner
- IFS, University of Stuttgart
C. Angrick, T. Zwosta - AUDI AG
J. Neubeck - FKFS

Investigating tire wear and tire missions on an enclosed drum bed dynamometer

L. Schubert, M. P. Huber, D. E. Heuberger,
C. Lex, P. Fischer
- TU Graz

15:00

Investigating Hydrogen-Air Mixing in the Intake Manifold and Mitigating Abnormal Combustion through CFD Modelling

V. Parthiban - LICET
K. R. Karthikeyan, P. Paramasivam, N. Reddy,
V. Kirubaharan, H. Satya Vishnu, C. Vijay Ram,
S. K. Pandey, Y. Bolar, K. Sadagopan
- Ashok Leyland Ltd.

Enhancing Sustainability in Automotive Design: A Case Study on Reducing CO₂ Emissions from BorgWarner's eXD

L. Gren, J. Brorsson - BorgWarner Sweden
V. Heinz - BorgWarner Heidelberg

Next Gen Power Unit for Power Sport Vehicles

M. Schermann, T. Feichtinger, H. Frühwirth,
T. Krenek, G. Pusch
- BRP-Rotax Vienna GmbH

Merging the Virtual World and Reality on the Vehicle-in-the-Loop Test Bench

P. Piecha - IPG Automotive GmbH
P. Rautenberg
- FAST, Karlsruhe Institute of Technology

Development of new Standards and Regulations on Tyre Abrasion

L. Netsch, K. Baltruschat
- TÜV SÜD Product Service GmbH



15:40 Plenary Discussion - The Use of Artificial Intelligence in Automotive Applications



Stephan Durach

Senior Vice President Connected Company Development,
BMW



Prof. Dr. Ralf G. Herrtwich

Senior Director Automotive Software
NVIDIA



Nikolai Ardey

Executive Director
VW Group Innovation

16:40 Closing Address

Univ.-Prof. Dr.-Ing.

Lutz Eckstein

Institute Director, ika, RWTH Aachen University

Univ.-Prof. Dr.-Ing.

Stefan Pischinger

Institute Director, TME, RWTH Aachen University



16:45 End of Colloquium