



Science for a
moving society

PROGRAMME · SPRING 2024

The FVV
Transfer + Networking
Event

13–15 March 2024

WÜRZBURG · GERMANY



Collective intelligence –
FVV members



Empowering a moving
society – Participating
research and technology
(RTD) performers



Science for a
moving society

Transfer + Networking

- + Industrial Collective Research (IGF) has a particular commitment to the transfer of knowledge. It empowers companies to meet the requirements of social responsibility and sustainable development and to address the associated technological change by solving common R&D issues on a pre-competitive, science-based approach. This unique collaboration bridges the gap between basic research and industrial application. The results are available to all interested parties and form the basis for individual adaptations and further development in the companies.
- + FVV organises open-topic research along the value chains, bringing together companies with the same interests regardless of size and economic power. We network bright minds and benefit from their knowledge and experience. At FVV manufacturers and suppliers, developers and scientists, leading industrial engineers, renowned academic researchers and excellent young talents meet on a regular basis, thus creating mutual understanding. This is very important to us: ideas sometimes need time and a prolific place to grow.

At FVV Transfer + Networking Events you will find both.



Information Sessions

14 March 2024

Session 1
SYSTEMS, COMPONENTS
09:15 – 18:00

4–7

Session 2
TURBOMACHINERY
09:45 – 18:00

8–10

11:00 – 11:45 / 10:45 – 11:30 Coffee Break · 13:00 – 14:30 Lunch Break · 16:15 – 17:00 Coffee Break

EVENING RECEPTION

Start 19:00 · Evening reception for all conference participants
Venue: Maritim Hotel Würzburg, Pleichertorstr. 5, 97070 Würzburg, Germany

FVV Committee Meetings

13 + 15 March 2024

The committee meetings are for members of the FVV only.
FVV members will receive the related agendas and documents fifteen days prior to the meeting.

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|----------|---------------|--|
| 13 March | 12:00 – 15:00 | Expert Group Electric Motors |
| | 14:00 – 16:00 | Steering Group Dynamics and Acoustics |
| | 16:00 – 18:00 | Research Committee |
| 15 March | 09:30 – 16:00 | Expert Groups Sustainable Powertrain Systems, Engines, Fuel Cells,
Turbo Machines, Zero-impact Emissions, Materials Science and Recycling |
| | 16:00 – 18:00 | Research Committee |

MAKE IT NEW: MAKING PROJECTS WORK

11

REGISTRATION & CONTACT

12

09:15 Benchmark Platform for Scale Resolving Simulations

A combined experimental-numerical benchmark platform for scale-resolved simulations with a focus on ignition and early flame propagation

PROJECT	1387 · Development Tools · EG Engines · Final report
PRESENTERS	Dr. Benjamin Böhm (TU Darmstadt, RSM) Prof. Dr. Christian Hasse (TU Darmstadt, STFS)
RTDs	Prof. Dr. Andreas Dreizler (TU Darmstadt, RSM) Prof. Dr. Christian Hasse (TU Darmstadt, STFS)
COORDINATION	Kathrin Giefer (Ford-Werke GmbH) Dr. Frank Krämer (Ford-Werke GmbH)
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09:45 Heuristic Search and Deep Learning

Application of artificial intelligence (AI) techniques, especially reinforcement learning, deep learning and heuristic search, in the field of engine development

PROJECT	1426 · Artificial intelligence (AI) · EG Engines · Final report
PRESENTERS	Sasa Milojevic (Uni Stuttgart, IFS) Tobias Brinkmann (RWTH Aachen, MMP)
RTDs	Prof. Dr. André Casal Kulzer (Uni Stuttgart, IFS) Prof. Dr. Jakob Andert (RWTH Aachen, MMP)
COORDINATION	Simone Mirco (TOYOTA GAZOO Racing Europe GmbH)
SPONSOR	BMWK/IGF

10:15 DIH2jet (DI Hydrogen Combustion Process)

High-efficiency combustion process for hydrogen-based fuels

PROJECT	1446 · Fuels Efficiency · EG Engines · Final report
PRESENTERS	Anne Beyer (Uni Stuttgart, IFS) Michelangelo Balmelli (Empa)
RTDs	Prof. Dr. André Casal Kulzer (Uni Stuttgart, IFS) Christian Bach (Empa)
COORDINATION	Dr. Stephan Liebsch (IAV GmbH)
SPONSOR	FVV own funds, CORNET/BMWK/IGF

11:00 Coffee Break

11:45 **Modelling Approaches of Vehicle Induced PN/PM and Emission Reduction Strategies**

PN/PM tailpipe simulation, evaluation of modelling approaches for brake and tyre induced particles and development of advanced control strategies

PROJECT	1499 · Emissions · EG Zero-impact Emissions · Interim report
PRESENTER	Ferris Herkenrath (RWTH Aachen, tme)
RTD	Prof. Dr. (USA) Stefan Pischinger (RWTH Aachen, tme)
COORDINATION	Dr. Frank Bunar (IAV GmbH)
SPONSOR	FVV own funds

12:15 **TWC Reaction under High-frequency Lambda Switching**

TWC reaction mechanism identification under high-frequency lambda switching condition (dithering)

PROJECT	1482 · Emissions · EG Zero-impact Emissions · Final report
PRESENTERS	Prof. Dr. Olaf Deutschmann (KIT Karlsruhe, ITCP) Prof. Jin Kusaka (Waseda University)
RTDs	Dr. Patrick Lott (KIT Karlsruhe, Abgaszentrum) Prof. Dr. Olaf Deutschmann (KIT Karlsruhe, ITCP) Prof. Jin Kusaka (Waseda University) Prof. Dr. Thomas Koch (KIT Karlsruhe, IFKM)
COORDINATION	Toshihiro Mori (Toyota Motor Corporation)
SPONSOR	CORNET/BMWK/IGF

13:00 **Lunch Break**

14:30 Pass-by Noise Simulation

Simulation of noise emission during accelerated pass-by according to ISO 362

PROJECT	1489 · Emissions · EG Sustainable Powertrain Systems · Final report
PRESENTER	Simon Böld (RWTH Aachen, tme)
RTD	Prof. Dr. (USA) Stefan Pischinger (RWTH Aachen, tme)
COORDINATION	Dr. Stefan Heuer (MAN Truck & Bus SE)
SPONSOR	FVV own funds

15:00 Real Driving Data for Automotive Application

Real Driving Data and Use Cases for Automotive Powertrain Development

PROJECT	1488 · Hybrids · EG Sustainable Powertrain Systems · Interim report
PRESENTERS	Ulf Kühne (TU Braunschweig, ivb) Marcel Sander (TU Braunschweig, IfF)
RTDs	Prof. Dr. Roman Henze (TU Braunschweig, IfF) Prof. Dr. Peter Eilts (TU Braunschweig, ivb)
COORDINATION	Stefan Gottlieb (Robert Bosch GmbH)
SPONSOR	FVV own funds

15:30 On-board Emission Conformity Monitoring (OBECOM)

Emission monitoring in automobiles with on-board measurement

PROJECT	1460 · Emissions · EG Sustainable Powertrain Systems · Final report
PRESENTERS	Prof. Dr. Thomas Koch (KIT Karlsruhe, IFKM) Prof. Dr. Frank Atzler (TU Dresden, LVM) Prof. Dr. Jose Ignacio Huertas (Tecnológico de Monterrey)
RTDs	Prof. Dr. Thomas Koch (KIT Karlsruhe, IFKM) Prof. Dr. Frank Atzler (TU Dresden, LVM) Prof. Dr. Jose Ignacio Huertas (Tecnológico de Monterrey)
COORDINATION	Dr. Heike Többen (Purem GmbH)
SPONSOR	FVV own funds, CORNET / BMWK / IGF

16:15 Coffee Break

17:00 CFD Simulation of Droplet Separators

Development and implementation of an experimentally validated 3D-CFD model for the simulation of the separation efficiency of droplet separators for fuel cell systems

PROJECT	1455 · Development tools · EG Fuel Cells · Interim report
PRESENTER	Dr. Digvijay Singh (Helmholtz-Zentrum Dresden-Rossendorf)
RTD	Dr. Dirk Lucas (Helmholtz-Zentrum Dresden-Rossendorf)
COORDINATION	Dr. Michael Harenbrock (MANN+HUMMEL GmbH)
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17:30 Lifetime Model Winding Insulation

The development of a holistic lifetime model for winding insulations of electrical machines on the basis of the acting damage mechanisms and their different characteristics

PROJECT	1441 · Materials · EG Materials Science & Recycling · Final report
PRESENTERS	Chuxuan He (Uni Stuttgart, IEH) Philipp Mell (Uni Stuttgart, IMA)
RTDs	Prof. Andreas Nicola (Uni Stuttgart, IMA) Prof. Dr. Stefan Tenbohlen (Uni Stuttgart, IEH)
COORDINATION	Dr. Zeljana Beslic (SEG Automotive Germany GmbH)
SPONSOR	BMWK/IGF

18:00 End

09:45 Tilting Pad Bearing Elastokinetics

Improvement of dynamic modeling and determination of pad stability criteria of tilting pad journal bearings considering elastic pad deformation and lubricant film inertial forces

PROJECT	1469 · Development Tools · EG Turbo Machines · Interim report
PRESENTER	Dr. Daniel Vetter (TU Clausthal, ITR)
RTD	Prof. Dr. Hubert Schwarze (TU Clausthal, ITR)
COORDINATION	Dr. Tobias Wiedemann (MAN Energy Solutions SE)
SPONSOR	BMWK/IGF

10:15 Cooling Flow Measurements Using MRI

Experimental investigation of impingement and film cooling flows using magnetic resonance imaging (MRI) to validate numerical methods

PROJECT	1465 · Development Tools · EG Turbo Machines · Interim report
PRESENTER	Dr. Martin Bruschewski (Uni Rostock, LSM)
RTD	Prof. Dr. Sven Grundmann (Uni Rostock, LSM)
COORDINATION	Dr. Robert Krewinkel (MAN Energy Solutions SE)
SPONSOR	BMWK/IGF

10:45 Coffee Break

11:30 Inverse Dynamic Analysis

Development of a methodology for the simultaneous evaluation of parameter ranges for the non-linear dynamic design of bladings based on inverse optimization

PROJECT	1485 · Development Tools · EG Turbo Machines · Interim report
PRESENTER	Dr. Sebastian Tatzko (Leibniz Uni Hannover, IDS)
RTD	Prof. Dr. Jörg Wallaschek (Leibniz Uni Hannover, IDS)
COORDINATION	Dr. Andreas Hartung (MTU Aero Engines AG)
SPONSOR	FVV own funds, DFG

12:00 Optimization with Frequency Domain Based Methods

Application of frequency domain based flow solvers for the optimization of turbomachinery components based on the example of a turbine stage with end-wall contouring and purge flow influence

PROJECT	1462 · Development Tools · EG Turbo Machines · Interim report
PRESENTERS	Robin Brüggemann (RWTH Aachen, IST) Dr. Yingjie Zhang (RWTH Aachen, IST)
RTD	Prof. Dr. Peter Jeschke (RWTH Aachen, IST)
COORDINATION	Dr. Stephan Behre (MTU Aero Enginges AG)
SPONSOR	FVV own funds, BMWK/PtJ

12:30 Unsteady Tandem Flow

Unsteady flow phenomena in tandem blade multi-stage axial compressors

PROJECT	1360 · Development Tools · EG Turbo Machines · Final report
PRESENTER	Daniel Jäger (TU München, LTF)
RTD	Prof. Dr. Volker Gümmer (TU München, LTF)
COORDINATION	Dr. Henner Schrapp (Rolls-Royce Deutschland Ltd & Co KG)
SPONSOR	FVV own funds, DFG

13:00 Lunch Break
14:30 »Physics-based Thermoacoustic Modelling«

Keynote lecture: Progress and Challenges of Physics-based Thermoacoustic Modelling

PRESENTER	Prof. Dr. Kilian Oberleithner (TU Berlin, ISTA)
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15:15 Flexible HP-Turbines

Aerothermal interaction mechanisms at the outer casing region of modern high pressure turbines

PROJECT	1447 · Development Tools · EG Turbo Machines · Interim report
PRESENTERS	Dominik Ade (TU Darmstadt, GLR) Marius Linne (TU Darmstadt, GLR)
RTD	Prof. Dr. Heinz-Peter Schiffer (TU Darmstadt, GLR)
COORDINATION	Christoph Lyko (Rolls-Royce Deutschland Ltd & Co KG)
SPONSOR	FVV own funds, DFG

15:45 Dynamic of Swirl and Jet Flames II

Prediction of the flame transfer functions of swirl and jet flames

PROJECT	1421 · Development Tools · EG Turbo Machines · Final report
PRESENTER	Prof. Dr. Kilian Oberleithner (TU Berlin, ISTA)
RTDs	Prof. Dr. Kilian Oberleithner (TU Berlin, ISTA) Prof. Dr. Wolfgang Polifke (TU München, TFD)
COORDINATION	Dr. Lukasz Panek (Siemens Energy Global GmbH & Co. KG)
SPONSOR	FVV own funds, DFG

16:15 Coffee Break
17:00 Constraint Effect in Component Design

Innovative and sustainable research cooperations need a stable funding framework. Our projects are funded through contributions from member companies, cooperations and from public research funds.

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