



VEHICLE TECHNOLOGY

Aerodynamics, new vehicle concepts, driving dynamics and driver assistance systems

VEHICLE POWERTRAIN

Hybrid technology, alternative fuels, spark-ignition and diesel engines, engine management and modeling

VEHICLE ELECTRONICS

Electric vehicles, software and design, modeling and simulation

/// SCIENTIFIC DIRECTORS OF THE SYMPOSIUM

Prof. Dr. Michael Bargende

Prof. Dr. Hans-Christian Reuss

Prof. Dr. Jochen Wiedemann

FKFS



12th Stuttgart International Symposium

Automotive and Engine Technology

13 and 14 March 2012 | Stuttgart | Germany

SCIENTIFIC ADVISORY BOARD



Prof. Dr. Michael Bargende
FKFS/IVK,
University of Stuttgart



Michael Dick
AUDI AG



Prof. em. Dr. Ulf Essers
FKFS/IVK,
University of Stuttgart



Wolfgang Hatz
Dr. Ing. h.c. F. Porsche AG



Dr. Thomas Heckenberger
Behr GmbH & Co. KG



Dr. Reiner Künzel
MAHLE International GmbH



Dr. Rolf Leonhard
Robert Bosch GmbH



Dr. Harald Naunheimer
ZF Friedrichshafen AG



Prof. Dr. Hans-Christian Reuss
FKFS/IVK,
University of Stuttgart



Wolfgang Siebenpfeiffer
Editor-in-Charge ATZ | MTZ



Alfred Weber
MANN+HUMMEL GmbH



Prof. Dr. Thomas Weber
Daimler AG



Dr. Olaf Toedter
BorgWarner BERU Systems GmbH



Prof. Dr. Jochen Wiedemann
FKFS/IVK,
University of Stuttgart



Johannes Winterhagen
Editor-in-Chief ATZ



Wolfgang Zahn
ANDREAS STIHL AG & Co. KG



Werner Zobel
Modine Europe GmbH



WELCOME

The Stuttgart International Symposium “Automotive and Engine Technology” organized by the Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS) takes place on 13 and 14 March 2012. As the patron of this event, I would like to warmly welcome the organizers, speakers and participants of this symposium, which is now being held for the 12th time.

Baden-Wuerttemberg, the birthplace of the automobile, sets great store by the further development of sustainable mobility concepts in response to climate change and the depletion of fossil energy resources. It is our responsibility to ensure that road traffic is designed to protect the climate and conserve resources to the greatest possible extent. The entire State is working hard at developing suitable solutions. For that reason, I am particularly pleased that the 12th Stuttgart International Symposium is primarily addressing the issues of hybrid technology and electric mobility. A further topic will be the effects that a changeover to alternative drive systems will have on the automobile.

Ever since the invention of the automobile in 1886, Baden-Wuerttemberg’s creative minds and engineers have repeatedly proven their capacity for innovation. I am therefore convinced that, in the future, our State will continue to be the initiator of new concepts and solutions that bring emission-free driving one step closer. Sustainable ideas and products from Baden-Wuerttemberg that enable environmentally friendly mobility to be achieved not only help protect the environment. Their quality and their groundbreaking character also mean that they have potential for worldwide economic success.

As one of Europe’s biggest conferences on the subject of automotive and engine technology, the Stuttgart International Symposium plays a major role as a forum for the exchange of opinions and ideas. At the same time, it is an important worldwide showcase for automotive engineers and creative ideas from Baden-Wuerttemberg.

My special thanks go to the Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS) and to all the partner companies involved in organizing and carrying out the symposium, which underlines the importance of Baden-Wuerttemberg as a key automotive location. I hope that all those taking part will find exciting lectures, interesting discussions and many new ideas.

Winfried Kretschmann

Winfried Kretschmann
Prime Minister
of the State of Baden-Wuerttemberg



RESEARCH AND DEVELOPMENT IN AUTOMOTIVE AND ENGINE TECHNOLOGY

Automotive development is facing a number of challenges that require maximum effort and innovation in all areas of vehicle and powertrain technology. Mobility is in a state of fundamental change. Many different mobility concepts are now being presented both for passenger transportation and for goods traffic. Furthermore, developments in the automotive industry must meet the different expectations of customers from all over the world. The resulting diversification of the products together with the different types of electrification of the powertrain present the automotive industry with multi-dimensional complexity issues. In order to meet these challenges, the definition of key areas of development and the application of virtual development tools are indispensable. The bandwidth of different approaches is reflected in more than 80 papers being presented at the

12th Stuttgart International Symposium “Automotive and Engine Technology” on 13 and 14 March 2012.

As expected, the conference program will focus in particular on highly interesting scenario considerations. Presented by leading experts from industry and science, the papers at the symposium will cover the entire bandwidth of current future vehicle and engine technology, including topics relating to production and rail vehicles. The four parallel strands of the symposium will offer you an ideal opportunity to acquire information about future concepts, the latest research findings and, of course, the current state of the art in technology, and to discuss them with a circle of experts. A further possibility for an exchange of ideas is offered by the parallel trade exhibition. The keynote speakers from industry, research and politics as well as the concluding panel discussion will address issues of development focus in a globalized industry.

We look forward to seeing you in Stuttgart, the birthplace of the automobile, and wish you a pleasant journey here as well as a stimulating and interesting stay in Stuttgart.

Prof. Dr.-Ing. Michael Bargende
Prof. Dr.-Ing. Hans-Christian Reuss
Prof. Dr.-Ing. Jochen Wiedemann

12TH STUTTGART INTERNATIONAL SYMPOSIUM

Automotive and Engine Technology

The 12th Stuttgart International Symposium “Automotive and Engine Technology”, which takes place on 13 and 14 March 2012, clearly demonstrates the progress that has been made in this field and how future individual mobility might affect our lives. The largest event for automotive experts in southern Germany – organized by the Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS) at the University of Stuttgart, in cooperation with ATZlive and supported by the specialist magazines ATZ and MTZ as media partners – will include more than 80 papers discussing all aspects of how further improvements in reducing fuel consumption and emissions can be achieved. The aim of optimizing the complete vehicle can only be attained if improvements to the powertrain are also supported by positive contributions from vehicle body engineering, including interior equipment, and the chassis.

For decades now, continuously higher safety and comfort requirements have resulted in a constant increase in body weight. The automotive industry is countering this trend with intelligent lightweight design concepts. Recently, things have become a little quieter concerning the electrification of individual transport, and what has often been an emotional discussion has now given way to a more objective consideration of the issue. Nevertheless, the Stuttgart Symposium will show that work on electrified powertrains has not disappeared into the desks of researchers and developers. Behind the scenes of the industry, quite the opposite is the case. Investment in new technologies such as hybrid and electric vehicles has been increasing year by year.

Experts are still intensively discussing what the car of the future might look like and which drive concepts will be successful in the long term. But one thing is certain: there will not be just one solution. Many different solutions for different requirements and different locations will continue to characterize road traffic in our globalized world. For that reason, I wish all participants at the Stuttgart Symposium a fertile and stimulating exchange of information and ideas, and I look forward to meeting you there.

Wolfgang Siebenpfeiffer
Editor-in-Charge ATZ | MTZ

DELEGATES

The Stuttgart Symposium is addressed to employees of the automotive manufacturers and their suppliers from the fields of R&D, production, aerodynamics, simulation, vehicle engineering and powertrain development, as well as service providers, software companies and universities.

FORMAL RECEPTION

Tuesday 13 March 2012 | 7:00 pm
at the “Alte Stuttgarter Reithalle”
Maritim Hotel | Seidenstraße 34
70174 Stuttgart | Germany

Enjoy an exceptional evening of top-class entertainment.

Program:

7:00 pm Champagne reception

Welcome

Prof. Dr. Hans-Christian Reuss
Member of the FKFS Board of Management and Professor for Vehicle Mechatronics at the Institute for Internal Combustion Engines and Automotive Engineering (IVK), University of Stuttgart

Followed by dinner

You will be entertained by
“Jessy Martens – A new Voice in Blues”.

“Here comes the new Lady Blues!” and “A voice to adore” was the verdict of the online magazine “rocktimes”! Vocalist and power-pack Jessy Martens is seen by many as Germany’s outstanding Blues talent. With her “surprisingly mature voice and a stage presence bursting with energy” (Bluesnews magazine), the Hamburg-born singer “with a fine set of pipes” (Die Welt) has taken the main stages of leading festivals in Germany and abroad by storm in just a few years. Together with her band, Jessy Martens delivers her songs with her own powerful, rock-soul sound. “Live on stage” is exactly her “thing”!

Reception ends at approximately 11:00 pm

Simultaneous interpreting in German/English and English/German is provided on both days of the symposium. The German version of the program is available at www.ATZlive.de or by calling +49 (0)611 / 78 78 – 131.



>> **PLENARY SECTION**

König Karl Hall

from

8:00 **Registration**

9:00 **Welcome**

Prof. Dr. Michael Bargende, Chairman of the FKFS Board of Management and Managing Director of the Institute for Internal Combustion Engines and Automotive Engineering (IVK), University of Stuttgart

Opening address

Prof. Dr. Wolfram Ressel,
Rector of the University of Stuttgart

9:15 **Development trends for electric vehicles in China**

Dr. Li Jun, Vice Chief Engineer, China FAW Group Corporation, President of R&D Center, FAW;
FISITA President Elect

Concepts and requirements for large industrial engines of the future

Dr. Ulrich Dohle, Member of the Board, Tognum AG

The electrification of the propulsion system at General Motors – strategy, technology and products

Prof. Dr. Uwe-Dieter Grebe, Executive Director – Advanced Technology Work and Alternative Propulsion, General Motors Europe

10:30 Refreshment break with coffee and tea

11:00 **Four parallel sections**

12:30 Lunch together in the exhibition area

14:00 **Four parallel sections**

15:30 Refreshment break with coffee and tea

16:00 **Four parallel sections**

18:00 End of the parallel sections

19:00 **Formal reception at the “Alte Stuttgarter Reithalle”**

Welcome

Prof. Dr. Hans-Christian Reuss, Member of the FKFS Board of Management and Professor for Vehicle Mechatronics at the Institute for Internal Combustion Engines and Automotive Engineering (IVK), University of Stuttgart

Enjoy stimulating discussions with fellow participants and speakers in a relaxing atmosphere.

>> SECTION 1

König Karl Hall

E-MOBILITY AND BATTERY TECHNOLOGIES I

Chairman: Prof. Johann Tomforde

- 11:00 **Electric mobility – transformation of the powertrain value chain and implications for OEMs and suppliers**
Dr. Christian Malorny, Dr. M. Lindner, McKinsey & Company, Inc.
- 11:30 **E-mobility – market assessment, challenges & solutions**
Edmund Erich, Delphi Deutschland GmbH
- 12:00 **E-mobility solutions for automotive and non-automotive applications**
Heiko Weller, Bosch Engineering GmbH
- 12:30 Lunch together in the exhibition area
- E-MOBILITY AND BATTERY TECHNOLOGIES II**
Chairman: Prof. Dr. Werner Tillmetz
- 14:00 **Smart charging – the intelligent vehicle-to-grid communication**
Dr. Tim Schlüsener, W. Preuschoff, Daimler AG
- 14:30 **Customer expectations and technical solutions for 3rd generation electric vehicles – first results of the ELVA project**
Micha Lesemann, Forschungsgesellschaft Kraftfahrwesen mbH Aachen; M. Funcke, L. Ickert, Prof. Dr. L. Eckstein, ika, RWTH Aachen University
- 15:00 **High power output and long range: combined energy storage for a plug-in hybrid vehicle**
Jens Bockstette, M. Jäger, Prof. Dr. S. Pischinger, VKA, RWTH Aachen University; Dr. K. Habermann, Dr. T. Hülshorst, FEV GmbH
- 15:30 Refreshment break with coffee and tea

HYBRIDS

Chairman: Prof. Dr. Cornel Stan

- 16:00 **Solutions for 50 g/km CO₂**
Dr. Günter Fraidl, F. Beste, K. Küpper, M. Sattler, H. Sorger, M. Weißbäck, AVL List GmbH
- 16:30 **Presentation of a methodical approach to configure a plug-in hybrid system based on existing data**
Benedikt Nies, P. Kropf, Dr. T. Kell, BMW Group; Prof. Dr. U. Lindemann, TU Munich
- 17:00 **Optimization of hybrid strategies with heuristic algorithms**
Michael Planer, T. Krenek, Prof. Dr. T. Lauer, Prof. Dr. B. Geringer, IFA, TU Vienna; M. Zuschrott, Daimler AG
- 17:30 **The plug-in hybrid between the conflicting demands of Euro VI and CO₂ targets**
Carsten von Essen, M. Diezemann, F. Bunar, S. Adelberg, IAV GmbH

>> SECTION 2

Meidinger Room

DRIVING DYNAMICS

Chairman: Prof. Dr. Ansgar Trächtler

- 11:00 **An innovative approach for stability assessment with respect to dynamic driving at the adhesion limit**
Dr. Lars König, O. Wagner, L. Kaiser, Bosch Engineering GmbH
- 11:30 **Development of a driver model for optimal control of a racecar**
Timo Völkl, AUDI AG; Christopher Zinke, EFS GmbH; Prof. Dr. H. Winner, TU Darmstadt
- 12:00 **Influence of tyre lateral characteristics on full-vehicle properties**
Dr. Stefan Einsle, Dr. C. Schimmel, Dr. A. Wagner, AUDI AG
- 12:30 Lunch together in the exhibition area

VEHICLE SIMULATION

Chairman: Dr. Gerhard Hettich

- 14:00 **Energy-efficient vehicle operation by intelligent longitudinal control and route planning**
Dr. Michael Henn, Dr. T. Lösche-ter Horst, F. Schulze, Dr. P. Bartsch, A. Gadanez, Dr. L. Jung, Volkswagen AG
- 14:30 **Concept of a new hardware in the loop driving simulator for the model-based design of mechatronic steering systems**
Steffen Stauder, Prof. Dr. S. Müller, MEC, TU Kaiserslautern; M. Plöger, A. Lehmann, dSPACE GmbH
- 15:00 **The new driving simulator of the University of Stuttgart**
Dr. Gerd Baumann, T. Riemer, FKFS; Dr. A. Piegsa, C. Liedecke, P. Rumbolz, A. Schmidt, IVK, University of Stuttgart
- 15:30 Refreshment break with coffee and tea

THERMAL MANAGEMENT

Chairman: Franz Loogen

- 16:00 **e performance – more range with thermal management**
Carl Bohman, Bosch Engineering GmbH
- 16:30 **Thermal simulation of a battery electric vehicle**
Markus Auer, Prof. Dr. J. Wiedemann, Prof. Dr. H.-C. Reuss, IVK, University of Stuttgart; Dr. T. Kuthada, Dr. M. Grimm, FKFS; S. Krug, ZSW BW
- 17:00 **Effects of new air conditioning concepts on the CO₂ emission of vehicles with a conventional powertrain**
Jan Ackermann, IAV GmbH
- 17:30 **Lightweight components with an adjustable thermal interface for battery cooling**
Dr. Achim Wiebelt, S. Hirsch, C. Schmid, Dr. T. Heckenberger, Behr GmbH & Co. KG

DIESEL ENGINES I**Chairman: Prof. Dr. Stefan Pischinger**

- 11:00 **Non-road mobile machinery emission strategies and resulting requirements for SCR systems**
Dr. Hartmut Lüders, M. Burger, M. Krüger, F.-J. Trompeter, Robert Bosch GmbH
- 11:30 **Impact of biodiesel fuel (RME) on the PM deposition of particulate filters**
Dr. Panayotis Dimopoulos Eggenschwiler, A. Liati, Empa Swiss Federal Laboratories for Materials Testing and Research
- 12:00 **Optimized DPF regeneration performance utilizing a model-based injection management approach**
Joschka Schaub, Prof. Dr. S. Pischinger, VKA, RWTH Aachen University; Dr. T. Schnorbus, Dr. C. Severin, A. Kolbeck, T. Körfer, FEV GmbH
- 12:30 Lunch together in the exhibition area

AERODYNAMICS**Chairman: Stephan Kopp**

- 14:00 **The aerodynamic development of the new Actros from Mercedes-Benz Trucks**
Thorsten Frank, Daimler AG
- 14:30 **Impact of wheel rotation on aerodynamic drag and lift**
Satheesh Kandasamy, H. Gau, F. Maroy, A. Belanger, Exa; Dr. N. Grün, Dr. S. Schäufele, BMW Group
- 15:00 **Active flow control: simulation of pulsed jets on an Ahmed bluff body**
Dr. Elisabeth Fournier, Dr. P. Gillieron, RENAULT Technocentre
- 15:30 Refreshment break with coffee and tea

DIESEL ENGINES II**Chairman: Prof. Dr. Peter Eilts**

- 16:00 **Strategies for closed loop control of glow plug surface temperature**
Dr. Olaf Toedter, Dr. M. Sackmann, Dr. M. Eberhardt, Dr. J. Hammer, BorgWarner BERU Systems GmbH; R. Suteekarn, DTSquare GmbH; I. Demirdelen, Prof. Dr. F. Puente, IIIT, Karlsruhe Institute of Technology
- 16:30 **Fuel-in-oil detection strategy by an oil quality sensor**
Vittorio Antonio Tucci, N. Vennetilli, Fiat Powertrain Technologies S.p.A.; C. Sidoti, FPT Industrial
- 17:00 **Reduction of emission variance by intelligent air path control**
Dr. Thorsten Schnorbus, Y. Hu, J. Schaub, A. Kolbeck, T. Körfer, FEV GmbH
- 17:30 **Cylinder charge-based injection control for diesel engines**
Nils Arnold, H. Henning, I. Kutschera, AUDI AG; Prof. Dr. M. Bargende, IVK, University of Stuttgart

RAILWAY VEHICLES I**Chairman: Prof. Dr. Dieter Bögle**

- 11:00 **Methodology for creating load-adapted car body structures and its implementation in a car body segment**
Jens König, G. Kopp, Prof. Dr. H. E. Friedrich, Institute for Vehicle Concepts, DLR e. V.; Dr. M. Schön, Bombardier Transportation
- 11:30 **Current developments in railway maintenance**
Dr. Burkhard Schulte-Werning, Dr. I. Trockels, H. Hintze, Dr. K. Mädler, F. Wolf, DB Systemtechnik, Deutsche Bahn AG
- 12:00 **Trams are electrifying modern cities**
Ulf Braker, Stadler Pankow GmbH
- 12:30 Lunch together in the exhibition area

RAILWAY VEHICLES II**Chairman: Thomas Moser**

- 14:00 **COMORAN – Condition Monitoring for Railway Applications – as an integral part of a brake control and wheel slide protection system**
Ulf Friesen, Dr. J.-J. Wach, M.-O. Herden, Knorr-Bremse Systems for Rail Vehicles
- 14:30 **Micro-pressure waves – a high-speed railway phenomenon**
Michael Hieke, DB Systemtechnik, Deutsche Bahn AG
- 15:00 **Development of stage IIIB diesel engines for railcars to integrate into new and existing vehicles**
Andreas Wegmann, Voith Turbo GmbH & Co. KG
- 15:30 Refreshment break with coffee and tea

E/E ARCHITECTURE**Chairman: Prof. Dr. Jörn-Uwe Varchmin**

- 16:00 **An approach of a contract-based electric-electronic architecture**
Bernhard Schmidt, TraceTronic GmbH
- 16:30 **Configurable LIN, CAN, FlexRay gateway for vehicle use**
Sergei Gontscharov, F. Hühn, Prof. Dr. K.-L. Krieger, ITEM, University of Bremen
- 17:00 **Challenges for implementing standardized SW architectures in 8- and 16-bit environments**
Dr. Peter Kappelmann, U. Löhnert, R. Moritz, Robert Bosch GmbH
- 17:30 **Development and analysis of on-board power systems using multidiscipline simulation**
Emanuel Bory, LMS Deutschland GmbH; N. Kieny, LMS Imagine; E. Laurain, Renault S.A.

>> SECTION 1

König Karl Hall

E-MOBILITY AND BATTERY TECHNOLOGIES III

Chairman: Prof. Karl-Ernst Noreikat

- 8:30 **Importance of standards for electric vehicles**
Jochen Thym, time4e; E. Stolz, park & charge
- 9:00 **New concepts for energy storages in an electric vehicle – battery modules which enunciate the power generation!**
Daniel Holder, Prof. Dr. T. Maier, IKTD, University of Stuttgart
- 9:30 **Dynamic simulation of a high-voltage traction battery**
Sina Krug, R. Kuhn, C. Günther, V. Spaeth, J. Klee Barillas, M. Danzer, ZSW BW; M. Auer, Prof. Dr. J. Wiedemann, IVK, University of Stuttgart

10:00 Refreshment break with coffee and tea

SI ENGINE

Chairman: Prof. Dr. Helmut Eichlseder

- 10:30 **Freedom in Formula Student – constraints in Formula 1**
Prof. Dr. Friedrich Indra
- 11:00 **Variable-length intake manifold for turbocharged engines**
Jürgen Stehlig, MAHLE Filtersysteme GmbH; R. Dingelstadt, MAHLE International GmbH; J. Taylor, D. Gurney, MAHLE Powertrain Ltd.
- 11:30 **Electronically controlled and battery-less injection system for small two-stroke SI engines**
Arno Kinnen, W. Layher, H. Däschner, ANDREAS STIHL AG & Co. KG

12:00 Lunch together in the exhibition area

POWERTRAIN CONCEPTS

Chairman: Prof. Dr. Nejila Parspour

- 13:30 **Comparison of different methods for efficiency improvement of the electric drive-train**
Prof. Dr. Dieter Gerling, K. Mühlbauer, EAA, Universität der Bundeswehr München; Dr. G. Dajaku, FEAAM GmbH
- 14:00 **E-axle module for electric vehicles and axle hybrids**
Dr. Bernd Vahlensieck, P. Casals, ZF Friedrichshafen AG
- 14:30 **Comparison of the applicability of a transverse flux reluctance machine and a transverse flux permanent magnet excited machine on utility vehicles**
Peter Seibold, M. Gärtner, F. Schuller, Prof. Dr. N. Parspour, IEW, University of Stuttgart

>> SECTION 2

Meidinger Room

VEHICLE ACOUSTICS AND VIBRATION I

Chairman: Prof. Dr. Lutz Eckstein

- 8:30 **Sound characteristic of electric vehicles – perception and impact**
Maren Hawighorst, P. Teller, Fraunhofer Institute for Building Physics IBP
- 9:00 **Reduction of synchronization time in automated transmissions for heavy-duty trucks by systematically induced drive train oscillations**
Daniel Kuncz, Prof. Dr. H.-C. Reuss, FKFS; M. Guggolz, D. Ulmer, Dr. J. Koch, Daimler AG
- 9:30 **Establish Procedure to avoid judder by effective gearbox design**
Jan Deleener, LMS International; Y. Ooi, H. Tsuji, Aisin AW

10:00 Refreshment break with coffee and tea

VEHICLE TECHNOLOGY I

Chairman: Dr. Claus Ehlers

- 10:30 **Design variety and lightweight design constraints in passenger car body production**
Klaus Wurster, Prof. Dr. M. Liewald, IFU, University of Stuttgart; Dr. K.-H. Füller, Daimler AG
- 11:00 **Development of vehicle body components relevant for side impact and assessment of the achieved occupant safety**
Dr. Jovan Obradovic, G. Belingardi, Politecnico di Torino; E. Ertugus, ika, RWTH Aachen University
- 11:30 **Complex geometric integration of chassis components. Virtual clearance validation in the early development phase.**
Sebastian Kokot, D. Berkan, BMW AG; Prof. Dr. M. Kröger, IMFK, TU Freiberg

12:00 Lunch together in the exhibition area

VEHICLE TECHNOLOGY II

Chairman: Prof. Dr. Horst E. Friedrich

- 13:30 **One cm more or less – who cares?**
Rainer E. Grünen, Adam Opel AG
- 14:00 **Analysis and compensation of rotor position signal disturbances in electric drives up to the field weakening region**
Eugen Sworowski, T. Pötzl, ZF Lenksysteme GmbH; Prof. Dr. H.-C. Reuss, IVK, University of Stuttgart
- 14:30 **Influence of the battery system on the static and dynamic properties of battery electric vehicles underfloor structure**
Collins Ntchouzou Nganko, Dr. J. W. Meschke, Volkswagen AG; Prof. Dr. T. Vietor, IKT, TU Braunschweig

MATERIALS AND LIGHTWEIGHT CONSTRUCTION

Chairman: Prof. Dr. Eberhard Roos

- 8:30 **It depends on the material – aluminium connecting rods**
Dr. Jambolka Brauner, Dr. R. Leiber, Leiber Group GmbH & Co. KG; Dr. U. Philipp, B. Burger, IVK, University of Stuttgart
- 9:00 **Function integration at fiber-reinforced structures at an example of the project “Active Lightweight Suspension“**
Oliver Deißer, Prof. Dr. H. E. Friedrich, Dr. A. Hölderlin, Institute for Vehicle Concepts, DLR e. V.
- 9:30 **Discontinuously reinforced light metals for automotive applications**
Martin Wenzelburger, GSaME; M. Silber, Prof. Dr. R. Gadow, IFKB, University of Stuttgart
- 10:00 Refreshment break with coffee and tea

AUTOSAR

Chairman: Prof. Dr. Karl-Ludwig Krieger

- 10:30 **Deployment of the AUTOSAR software architecture at Daimler**
Dr. Stefan Schmerler, Dr. C. Kühn, Daimler AG
- 11:00 **Driving dynamics simulation: space-segment model to evaluate GPS/INS fusion architectures**
Tobias Butz, U. Wurster, IPG Automotive GmbH; Prof. Dr. G. F. Trommer, M. Wankerl, ITE, Karlsruhe Institute of Technology
- 11:30 **A virtual validation platform for AUTOSAR software**
Nico Maldener, Dr. U. Freund, Dr. D. Ziegenbein, M. Ebert, ETAS GmbH
- 12:00 Lunch together in the exhibition area

SIMULATION TOOLS

Chairman: Prof. Dr. Klaus D. Müller-Glaser

- 13:00 **Simulation-based homologation of ESC systems according to ECE-R 13-H**
Dr. Henning Holzmann, K. M. Hahn, F. Weyer, M. Römer, Adam Opel AG; J. Webb, S. Boltshauser, A. Català, G. Tosolin, IDIADA Automotive Technology SA
- 13:30 **Perspectives and requirements for the standard implementation of HiL simulation in the calibration of engine management control units**
Marcel Richter, Robert Bosch Engineering GmbH; M. Boumans, I. Hein, Robert Bosch GmbH
- 14:00 **Condition monitoring and fault diagnosis of electric machines for automotive application**
Eduard Bakhach, B. Rehfus, Daimler AG; Prof. Dr. C. Gühmann, TU Berlin
- 14:30 **High-speed ECU measurement concept in combination with real-time bypassing for an EV/HEV engine**
Alfred Kless, Vector Informatik GmbH

REPORTS FROM FVV PROJECTS

Chairman: Dr. Karl Kollmann

- 8:30 **Phenomenological model for simulation of homogenous and partly homogenous diesel combustion**
Dominik Rether, Prof. Dr. M. Bargende, IVK, University of Stuttgart; Dr. C. Lämmle, Prof. Dr. K. Boulouchos, LAV, ETH Zurich
- 9:00 **Development of a gas discharge system for the crankshaft-resolved discharge of oil emissions from the combustion chambers of diesel engines**
Prof. Dr. Gerhard Matz, A. Behn, Institute of Measurement Technology, TU Hamburg-Harburg
- 9:30 **An improved approach for calculating non-steady-state wall heat losses during HCCI combustion**
Moritz Heinle, Prof. Dr. M. Bargende, IVK, University of Stuttgart; H.-J. Berner, FKFS
- 10:00 Refreshment break with coffee and tea

PRODUCTION ENGINEERING

Chairman: Prof. em. Dr. Engelbert Westkämper

- 10:30 **Effects of future mobility on automotive production**
Steven Peters, Prof. Dr. G. Lanza, wbk Institute of Production Science, Karlsruhe Institute of Technology
- 11:00 **Industrialization of the electric drivetrain for the BMW ActiveE**
Dr. Frank Möbius, Dr. J. Merwerth, E. Hockgeiger, BMW AG
- 11:30 **Numerical calculation of thermal manufacturing processes for product and process optimization of car body structures in the pre-series phase**
Christoph Albiez, Prof. Dr. M. Liewald, IFU, University of Stuttgart; A. Görres, Dr. M. Sindel, AUDI AG
- 12:00 Lunch together in the exhibition area

VEHICLE ACOUSTICS AND VIBRATION II

Chairman: Prof. Dr. Frank Gauterin

- 13:30 **Micro-perforated absorber to reduce the tire cavity mode**
Wolfgang Herget, Dr. P. Brandstätt, Fraunhofer Institute for Building Physics IBP
- 14:00 **Model-based calibration of a load change reaction control function with hybrid state space models**
Julien Pillias, Dr. F. Kirschbaum, Daimler AG
- 14:30 **Development of NVH comfort exemplified on the Mercedes-Benz M-Class**
Dr. Detlef Schulze-Fehrenbach, H.-P. Reifenrath, A. Schilp, B. Zobec, Daimler AG

>> **PLENARY SECTION** König Karl Hall

8:30 **Four parallel sections**

10:00 Refreshment break with coffee and tea

10:30 **Four parallel sections**

12:00 Lunch together in the exhibition area

13:00 **Four parallel sections**

15:00 Refreshment break with coffee and tea

15:30 **Panel discussion**

Focus of development in a globalized world

Introductory presentation:
Prof. Dr. Heinz K. Junker, Chairman
of the Management Board, MAHLE GmbH

Participants:
Peter Mertens, Senior Vice President
Research & Development, Volvo Car Corporation

Prof. Dr. Leopold Mikulic,
Vice President Cooperation Coordination
Renault/Nissan, Daimler AG

Harald Wester, CEO, Alfa Romeo Automobiles

Moderator:
Johannes Winterhagen, Editor-in-Chief ATZ

16:30 **Keynote speech**
Silke Krebs, Minister of state of the
state of Baden Wuerttemberg

16:45 **Closing remarks**
Prof. Dr. Jochen Wiedemann, Member of the FKFS
Board of Management and Professor for Automotive
Engineering at the Institute for Internal Combustion
Engines and Automotive Engineering (IVK),
University of Stuttgart

17:00 **Conference ends**



WITH KIND SUPPORT FROM OUR PARTNERS

Premium Partners

AUDI AG
Robert Bosch GmbH
Daimler AG

Main Partners

Behr GmbH & Co. KG
BorgWarner BERU Systems GmbH
Kistler Instrumente GmbH
MAHLE GmbH
MANN+HUMMEL GmbH
Modine Europe GmbH
Dr. Ing. h.c. F. Porsche AG
ANDREAS STIHL AG & Co. KG

Partners

Schreiber, Brand und Partner Ingenieurgesellschaft mbH
Tognum-Gruppe
Vector Informatik GmbH
ZF Friedrichshafen AG

List of Exhibitors – Stuttgart Symposium 2011

Advantage Austria | AFT Atlas Fahrzeugtechnik GmbH | AIT Austrian Institute of Technology | Altair Engineering GmbH | Anger Machining GmbH | ATZ Springer Automotive Media | B+B Thermo-Technik GmbH | Bertrandt AG | BorgWarner BERU Systems GmbH | CD-adapco | CEI GmbH | CFDnetwork Engineering | Daimler AG | Dassault Systèmes Simulia GmbH | DLR e. V. | dSpace GmbH | dTech Steyr GmbH | ElringKlinger Motortechnik GmbH | Emitec GmbH | e-mobil BW GmbH | ETAS GmbH | FKFS | Freudenberg Dichtungs- und Schwingungstechnik GmbH & Co. KG | Greenteam University of Stuttgart | HEAD acoustics GmbH | IAV GmbH | IPG Automotive GmbH | ITK Engineering AG | Kapolnek GmbH | Kistler Instrumente GmbH | Kompetenzzentrum – ViF mbH | LaVision GmbH | LMS Deutschland GmbH | MANN+HUMMEL GmbH | Optimol Instruments Prüftechnik GmbH | Racing team University of Stuttgart | Rücker AG | TZM | UKIP Media&Events Ltd | Vector Informatik GmbH | Vieweg+Teubner Verlag

EXHIBITION

**Tuesday 13 March 2012,
Wednesday 14 March 2012**

On Tuesday 13 March and Wednesday 14 March, a parallel trade exhibition will once again be held in the foyers of the conference venue. The automotive manufacturers and suppliers to the automotive industry will present the latest developments in vehicle and engine technology and metrology to an informed specialist audience.

YOUR PRESENTATION PLATFORM

Take the opportunity to present your latest products and services to the specialist audience as a supplier in our exclusive exhibition or as a sponsor. Why not make use of this meeting place for an exchange of specialist information between users and pioneers in this field?

We design individual sponsoring and exhibition packages according to your needs and requirements. You can choose from a wide range of options.

**For information on the various presentation options,
please contact:**

Kai Pielicke
ap-Media on behalf of ATZlive
Phone +49 (0)6242 / 990565
kai.pielicke@ap-media.eu

SPEAKERS, MEMBERS OF THE SCIENTIFIC ADVISORY BOARD, CHAIRMEN

Jan Ackermann

IAV GmbH

Christoph Albiez

IFU, University of Stuttgart

Nils Arnold

AUDI AG

Markus Auer

IVK, University of Stuttgart

Eduard Bakhach

Daimler AG

Prof. Dr. Michael Bargende

FKFS/IVK, University of Stuttgart

Dr. Gerd Baumann

FKFS

Jens Bockstette

VKA, RWTH Aachen University

Prof. Dr. Dieter Bögle

Carl Bohman

Bosch Engineering GmbH

Emanuel Bory

LMS Deutschland GmbH

Ulf Braker

Stadler Pankow GmbH

Dr. Jambolka Brauner

Leiber Group GmbH & Co. KG

Tobias Butz

IPG Automotive GmbH

Oliver Deißer

Institute for Vehicle Concepts, DLR e. V.

Jan Deleener

LMS International

Michael Dick

AUDI AG

Dr. Panayotis Dimopoulos Eggenschwiler

Empa Swiss Federal Laboratories for
Materials Testing and Research

Dr. Ulrich Dohle

Tognum AG

Prof. Dr. Lutz Eckstein

ika, RWTH Aachen University

Dr. Claus Ehlers

Daimler AG

Prof. Dr. Helmut Eichseder

VKM-THD, TU Graz

Prof. Dr. Peter Eilts

IVB, TU Braunschweig

Dr. Stefan Einsle

AUDI AG

Edmund Erich

Delphi Deutschland GmbH

Carsten von Essen

IAV GmbH

Prof. em. Dr. Ulf Essers

FKFS/IVK, University of Stuttgart

Dr. Elisabeth Fournier

RENAULT Technocentre

Dr. Günter Fraidl

AVL List GmbH

Thorsten Frank

Daimler AG

Prof. Dr. Horst E. Friedrich

Institute for Vehicle Concepts, DLR e. V.

Ulf Friesen

Knorr-Bremse Systems
for Rail Vehicles

Prof. Dr. Frank Gauterin

FAST, Karlsruhe Institute of Technology

Prof. Dr. Dieter Gerling

EAA, Universität der Bundeswehr
München

Sergei Gontscharov

ITEM, University of Bremen

Prof. Dr. Uwe-Dieter Grebe

General Motors Europe

Rainer E. Grünen

Adam Opel AG

Wolfgang Hatz

Dr. Ing. h.c. F. Porsche AG

Maren Hawighorst

Fraunhofer Institute for Building Physics
IBP

Dr. Thomas Heckenberger

Behr GmbH & Co. KG

Moritz Heinle

IVK, University of Stuttgart

Dr. Michael Henn

Volkswagen AG

Wolfgang Herget

Fraunhofer Institute for Building Physics
IBP

Dr. Gerhard Hettich

EAST Consulting

Michael Hieke

DB Systemtechnik, Deutsche Bahn AG

Daniel Holder

IKTD, University of Stuttgart

Dr. Henning Holzmann

Adam Opel AG

SPEAKERS, MEMBERS OF THE SCIENTIFIC ADVISORY BOARD, CHAIRMEN

Prof. Dr. Friedrich Indra

Prof. Dr. Heinz K. Junker
MAHLE GmbH

Satheesh Kandasamy
Exa Corporation

Dr. Peter Kappelmann
Robert Bosch GmbH

Arno Kinnen
ANDREAS STIHL AG & Co. KG

Alfred Kless
Vector Informatik GmbH

Sebastian Kokot
BMW AG

Dr. Karl Kollmann

Jens König
Institute for Vehicle Concepts, DLR e. V.

Dr. Lars König
Bosch Engineering GmbH

Stephan Kopp
MAN Nutzfahrzeuge AG

Prof. Dr. Karl-Ludwig Krieger
ITEM, University of Bremen

Sina Krug
Center for Solar Energy and Hydrogen
Research Baden-Wuerttemberg (ZSW)

Dr. Reiner Künzel
MAHLE International GmbH

Daniel Kuncz
FKFS

Dr. Rolf Leonhard
Robert Bosch GmbH

Micha Lesemann
Forschungsgesellschaft Kraftfahrwesen
mbH Aachen

Dr. Li Jun
FAW Group Corporation

Franz Loogen
e-mobil BW GmbH

Dr. Hartmut Lüders
Robert Bosch GmbH

Nico Maldener
ETAS GmbH

Dr. Christian Malorny
McKinsey & Company, Inc.

Prof. Dr. Gerhard Matz
Institute of Measurement Technology,
TU Hamburg-Harburg

Peter Mertens
Volvo Car Corporation

Prof. Dr. Leopold Mikulic
Daimler AG

Dr. Frank Möbius
BMW AG

Thomas Moser
SSB AG

Prof. Dr. Klaus D. Müller-Glaser
ITIV, Karlsruhe Institute of Technology

Dr. Harald Naunheimer
ZF Friedrichshafen AG

Benedikt Nies
BMW Group

Prof. Karl-Ernst Noreikat
NorCon Scientific Consulting

Collins Ntchouzou Nganko
Volkswagen AG

Dr. Jovan Obradovic
Politecnico di Torino

Prof. Dr. Nejila Parspour
IEW, University of Stuttgart

Steven Peters
wbk Institute of Production Science,
Karlsruhe Institute of Technology

Julien Pillias
Daimler AG

Prof. Dr. Stefan Pischinger
VKA, RWTH Aachen University

Michael Planer
IFA, TU Vienna

Prof. Dr. Wolfram Ressel
University of Stuttgart

Dominik Rether
IVK, University of Stuttgart

Prof. Dr. Hans-Christian Reuss
FKFS/IVK, University of Stuttgart

Marcel Richter
Robert Bosch Engineering GmbH

Prof. Dr. Eberhard Roos
MPA, University of Stuttgart

Joschka Schaub
VKA, RWTH Aachen University

Dr. Tim Schlüsener
Daimler AG

Dr. Stefan Schmerler
Daimler AG

Bernhard Schmidt
TraceTronic GmbH

Dr. Thorsten Schnorbus
FEV GmbH

Dr. Burkhard Schulte-Werning
DB Systemtechnik, Deutsche Bahn AG

SPEAKERS, MEMBERS OF THE SCIENTIFIC ADVISORY BOARD, CHAIRMEN

Dr. Detlef Schulze-Fehrenbach

Daimler AG

Peter Seibold

IEW, University of Stuttgart

Wolfgang Siebenpfeiffer

Editor-in-Charge ATZ | MTZ

Prof. Dr. Cornel Stan

Research and Transfer Center e. V.
at Zwickau University of Applied
Sciences

Steffen Stauder

MEC, TU Kaiserslautern

Jürgen Stehlig

MAHLE Filtersysteme GmbH

Eugen Sworowski

ZF Lenksysteme GmbH

Jochen Thym

time4e

Prof. Dr. Werner Tillmetz

Dr. Olaf Toedter

BorgWarner BERU Systems GmbH

Prof. Johann Tomforde

Competence & Design Center
for Mobility Innovations

Prof. Dr. Ansgar Trächtler

RtM, University of Paderborn

Vittorio Antonio Tucci

Fiat Powertrain Technologies S.p.A.

Dr. Bernd Vahlensieck

ZF Friedrichshafen AG

Prof. Dr. Jörn-Uwe Varchmin

Timo Völkl

AUDI AG

Alfred Weber

MANN+HUMMEL GmbH

Prof. Dr. Thomas Weber

Daimler AG

Andreas Wegmann

Voith Turbo GmbH & Co. KG

Heiko Weller

Bosch Engineering GmbH

Martin Wenzelburger

GSaME, University of Stuttgart

Harald Wester

Alfa Romeo Automobiles

Prof. em. Dr. Engelbert Westkämper

IFF, University of Stuttgart

Dr. Achim Wiebelt

Behr GmbH & Co. KG

Prof. Dr. Jochen Wiedemann

FKFS/IVK, University of Stuttgart

Johannes Winterhagen

Editor-in-Chief ATZ

Klaus Wurster

IFU, University of Stuttgart

Wolfgang Zahn

ANDREAS STIHL AG & Co. KG

Christopher Zinke

EFS GmbH

Werner Zobel

Modine Europe GmbH

THE ORGANIZERS

FKFS – Research Institute of Automotive Engineering and Vehicle Engines Stuttgart

FKFS is an independent institute which performs research and development work on behalf of the international automotive industry and carries out basic research in collaboration with its partner institute, IVK.



ATZlive // Automotive Engineering Under Discussion //

ATZlive organizes its high-caliber conferences for automotive engineers together with key representatives from research and industry to ensure that they are tailor-made to the needs of the participants and address the very latest issues. Our close collaboration with the editorial teams of our specialist magazines ATZ and MTZ keeps us fully up-to-date on the latest topics and trends on the market.

ATZlive is part of the world's second largest scientific publishing group, Springer Science + Business Media.



IN COOPERATION WITH

FVV – Forschungsvereinigung Verbrennungskraftmaschinen e. V. (Research Association for Combustion Engines)

The FVV – founded in 1956 – has become a network for engine and turbine development that is unique throughout the world. It promotes joint, pre-competitive research in the industry and brings industry experts and scientists together to continuously improve the efficiency and emissions of engines and turbines – to the benefit of industry, the environment and society.



www.fvv-net.de

THE MEDIA PARTNERS

ATZ

Automobiltechnische Zeitschrift, the specialist magazine for technology-oriented management in the automotive industry, provides up-to-date information from research and development.



MTZ

Motortechnische Zeitschrift is always one step ahead where engine development and technology are concerned and is full of detailed results from research and development for highly specialized engineers.



YOUR OWN PERSONAL COPY OF ATZ OR MTZ

All participants in the symposium receive one of the E-magazines ATZ worldwide or MTZ worldwide for two consecutive months free of charge and without obligation. When registering, please stipulate which magazine you would like to read.

ATZ



MTZ



REGISTRATION FEE

€ 995.– Registration fee

€ 495.– University/college staff members

The registration fee covers:

- : Admission to all events on both days
- : Conference documents
- : Lunch at the venue for each day of the conference and drinks during breaks
- : Admission to the formal evening reception

€ 495.– Single-day admission

€ 295.– University/college staff members

Single-day admission covers:

- : Admission to all events on one day
- : Conference documents
- : Lunch at the venue and drinks during breaks
- : Admission to the formal evening reception

Participants can change between the parallel sections at any time. The registration fee also includes admission to the accompanying trade fair.

All registration fees are subject to value added tax.

Students

Please inquire as to attendance fee.

After registration with enrolment certificate, students have free access to all presentations and to the trade exhibition (other services excluded).

A limited contingent of free tickets is available for **students of the University of Stuttgart**. On presentation of the enrolment certificate, these can be collected from the:

Institute for Internal Combustion Engines and Automotive Engineering (IVK)

Uta Fuchs – Marketing, Room 4.305,

Phone +49 (0)711 / 685 – 65628

Further information: symposium@fkfs.de

Mode of payment

By bank transfer after invoice or by credit card (Master, Visa).

CONDITIONS

No cancellation charge is due if registration is cancelled by 13 February 2012. Cancellations made after that date will incur a charge of 35 % of the registration fee. For cancellations made after 21 February 2012 the full registration fee is payable. Cancellations must be made in writing. The date of the postmark will determine whether the deadline has been met. We will gladly accept a replacement delegate at no extra charge.

Should a speaker be unable to attend at short notice by reason of force majeure, illness, accident or other circumstances for which ATZlive cannot be held responsible, another qualified person will be appointed to the exclusion of any claim for compensation. Should the event be cancelled altogether, we will of course refund the registration fee. No conference documentation may be reproduced or transferred to third parties without the express written consent of ATZlive. Audio and video recording of the conference is not permitted.

VENUE

Haus der Wirtschaft
Wirtschaftsministerium Baden-Wuerttemberg
Willy-Bleicher-Straße 19 | 70174 Stuttgart | Germany

Phone +49 (0)711 / 123 – 0

www.hausderwirtschaft.de

HOTEL

The following hotel has room blocks at reduced prices for the participants. **Please reserve by 1 February 2012 and refer to “Stuttgart Symposium”.**

Maritim Hotel Stuttgart

Seidenstraße 34 | 70174 Stuttgart | Germany

Phone +49 (0)711 / 942 – 1142

Fax +49 (0)711 / 942 – 1001

www.maritim.de

€ 139.– single room with breakfast

You can book other hotels in Stuttgart via:

www.stuttgart-tourist.de

LANGUAGES USED IN THE PRESENTATIONS

German and English with simultaneous interpreting (German – English / English – German)

YOUR OWN PERSONAL COPY OF ATZ OR MTZ

All participants in the symposium receive one of the E-magazines ATZ worldwide or MTZ worldwide for two consecutive months free of charge and without obligation.

Your personal details will be stored electronically in compliance with the German Data Protection Act. We will not disclose your address to third parties for advertising purposes. If you do not wish to receive information about our publishing products, please send an e-mail with your address details to widerspruch.springerfachmedien-wiesbaden@springer.com.

Please send the registration form by post or fax to:

ATZlive | Springer Automotive Media
Springer Fachmedien Wiesbaden GmbH

Birgit Ulber

Abraham-Lincoln-Straße 46

65189 Wiesbaden | Germany

Phone +49 (0)611 / 78 78 – 131

Fax +49 (0)611 / 78 78 – 452

ATZlive@springer.com

www.ATZlive.de

12th Stuttgart International Symposium

13 AND 14 MARCH 2012 | STUTTGART | GERMANY

REGISTRATION

Registration either by faxing the registration form to
Fax +49 (0)611/ 78 78 – 452
or online at www.ATZlive.de.

You will receive confirmation of participation upon receipt of your registration and be invoiced three weeks before the symposium. You will receive your conference documents when registering at the venue.
Please register one person per form only.

Registration data

Family name

First name

Acad. title

Company / Institute

Department

Function

Street / P.O. box

Postal code / City

Country

Phone, Fax

E-mail

Invoice address (if different from above address)

VAT ID no.

Date, Signature

Registration fee

University/college staff members

€ 995.-*
 € 495.-*

Single-day admission

University/college staff members

13.03.2012 14.03.2012

Student

Please inquire as to attendance fee

Students of the University of Stuttgart:
please contact the IVK directly.

Attendance at evening reception on 13 March 2012

yes no

Mode of payment

Bank transfer after invoice

Credit card (Master, Visa)

Card number

Card holder

Credit card valid until

**Please send me 2 editions of the E-magazine marked:
ATZ worldwide or MTZ worldwide to the following
E-mail address:**

Family name

First name

Acad. title

E-mail

Street / P.O. box

Country / Postal code / City

BY FAX TO +49 (0)611 / 78 78 – 452

CS000160



/// CONTACT + INFORMATION

ATZlive

Springer Automotive Media
Springer Fachmedien Wiesbaden GmbH
Abraham-Lincoln-Straße 46
65189 Wiesbaden
Germany

Birgit Ulber

Phone +49 (0)611 / 78 78 – 131

Fax +49 (0)611 / 78 78 – 452

ATZlive@springer.com

www.ATZlive.de

FKFS

Pfaffenwaldring 12
70569 Stuttgart
Germany