INDEX – Volume 1

SECTION 1

INNOVATIVE VEHICLES
Chairperson: Prof. Dr. Frank Gauterin

Urban EV project Visio.M – Concept highlights and latest prototype test results
Stefan Riederer, BMW Research and Technology

Performance and efficiency – technical solutions for high-performance sports cars to achieve future CO₂ limits
Bernhard Bihr, Gabriele Pieraccini, Holger Hofmann, Stefanie Freudenstein, Bosch Engineering GmbH

E-generation / Key technologies for electric vehicles
Michael Dimitrov, Dr. Ing. h.c. F. Porsche AG

CI ENGINES – COMPONENTS
Chairperson: Prof. Dr. Wolfgang Thiemann

Advanced diesel fuel injection equipment – A never ending BOSCH story
Jürgen Hammer, Michael Raff, Dirk Naber, Robert Bosch GmbH

Cascaded Indirect Integrated charge air cooling for passenger car diesel engines
Simon Schneider, MAHLE International GmbH; Andreas Eilemann, MAHLE Behr GmbH & Co. KG; Jürgen Stehlig, MAHLE Filtersysteme GmbH

Thermal management for a light-duty-vehicle with diesel engine: Evaluation of an optimized cooling system with variable cooling components
Wolfgang Wenzel, John Shutty, Jeri Tsai, BorgWarner, Inc.; Thomas Buchholz, BorgWarner Thermal Systems

VII
BATTERIES
Chairperson: Prof. Dr. Werner Tillmetz

A123 battery life simulation and validation test results 79
Jeff Kessen, Roland Jeutter, Christoph Fehrenbacher, A123 Systems

Integrated electronics for battery sensors 89
Jürgen Kernhof, Ayman Ghazi, Marko Radovic, ZMDI

Development of active Battery Management System 99
for test car and test results
Dan Jiang, M. Hübner, HTW Dresden

DRIVING DYNAMICS I
Chairperson: Prof. Dr. Ferit Kücükay

An effective process for trackside vehicle development 125
Paolo Bortolussi, Leonardo Pascali, Dr. Ing. h.c. F. Porsche AG;
Nico Castrup, RWTH Aachen

Integrated Vehicle Dynamics Control – an optimized approach 139
for linking multiple chassis actuators
Lars König, Thomas Walter, Benjamin Gutmayer, Dominik Merlein,
Bosch Engineering GmbH

Integration of chassis control system networking into the vehicle 151
dynamics development process
H.-C. Reuss, Jan-Hendrik Herold, University of Stuttgart;
Leonardo Pascali, Dr. Ing. h.c. F. Porsche AG

ELECTRICAL POWER MANAGEMENT
Chairperson: Prof. Nejila Parspour

Modular modeling of a PEM fuel cell system 167
for automotive applications
Raphael Hans, ETAS GmbH; Ferdinand Panik, HS Esslingen;
Hans-Christian Reuss, University of Stuttgart
Photovoltaic based inverter charger 181
Martin Neuburger, University of Applied Sciences Esslingen

Range extending for electric vehicle operation in urban-regional areas 199
Jens Bachstein, Andreas Daberkow, Heilbronn University;
Hans-Christian Reuss, University of Stuttgart, FKFS

PRODUCTION + DESIGN I
Chairperson: Prof. Dr. Rainer Gadow

Experimental study of unstretched fiber shifting during hemming processes for automotive aluminum alloys 215
Severin Hönle, Mathias Liewald, Philipp Schmid, IFU, University of Stuttgart;
Manfred Sindel, AUDI AG

Virtual production planning and dimensional accuracy prediction of sheet metal components in the bodyshell work 227
Christian Kästle, Daimler AG;
Mathias Liewald, Karl Roll, University of Stuttgart

SECTION 2

ADVANCED DRIVER ASSISTANCE SYSTEMS I
Chairperson: Prof. Dr. Tobias Flämig-Vetter

Ego-motion estimation in urban areas 241
Claudius Gläser, Lutz Bürkle, Frank Niewels,
Robert Bosch GmbH

New working model for collaboration of OEM and supplier in development of advanced driver assistance functionalities for series production 255
Ulrich Zoelch, Claus Dorrer, Martin Krenn, Martin Peller, Peter Varadi,
BMW AG; Dirk Böttcher, Jürgen Diebold, Hagen Stübing, Continental AG

An efficient environmental model for automated driving 267
Ralph Grewe, Andree Hohm, Stefan Lueke, Continental AG
HYBRID I
Chairperson: Prof. Karl-Ernst Noreikat

Emission optimized hybrid vehicle operation with thermal exhaust model
Florian Kunkel, Rolf Isermann, TU Darmstadt, Institute for Automatic Control and Mechatronics

Automated process integration and design optimization of a mathematics-based series-hybrid electric vehicle
Johannes Friebe, Thanh-Son Dao, Maplesoft GmbH;
Christine Schwarz, ISKO engineers AG

Definition and implementation of a benchmarking in order to derive success factors of hybrid powertrains
Albert Albers, Matthias Behrendt, Friedrich Brezger, Kevin Matros, Benedikt Steiger, IPEK – Institute of Product Engineering at Karlsruhe Institute of Technology (KIT); Heidelinde Holzer, Wolfram Bohne, BMW AG

SI ENGINES – IGNITION
Chairperson: Prof. Dr. Christian Beidl

Spark plugs for modern engines: challenges and solutions
Igor Orlandini, Arnold Schneider, Sabrina Rathgeber, Tobias Ruf, Robert Bosch GmbH

Simultaneous spatially resolved visualization of fuel/air ratio and residual gas distribution in an optically accessible SI-engine
Thomas Mederer, Wolfgang Friedrich, Johannes Trost, Lars Zigan, Michael Wensing, LTT, Friedrich-Alexander-University Erlangen-Nuremberg

Potential of corona ignition on gas engines using EGR and lean combustion
Alexander Schenk, Georg Rixecker, Volker Brichzin, BorgWarner BERU Systems GmbH; Michael Becker, BorgWarner Inc.
DRIVING DYNAMICS II
Chairperson: Prof. Dr. Oliver Sawodny

Improvement of collision avoidance systems by using a propulsion system for advanced brake performance
Sven Knecht, Jens Neubeck, Jochen Wiedemann, FKFS

Design of a decision maker for an evasive or braking maneuver for collision avoidance
Carlo Ackermann, R. Isermann, Institute of Automatic Control and Mechatronics, TU Darmstadt; Sukki Min, Changwon Kim, Hyundai Motor Company

FVV PROJECTS
Chairperson: Dr. Karl Kollmann

Characterization of gasoline biofuels regarding combustion anomalies
Marco Günther, Bastian Morcinkowski, Florian Kremer, Stefan Pischinger, RWTH Aachen University

In-cylinder causes of particle emissions on DISI engines
Helge Dageförde, Heiko Kubach, Thomas Koch, IFKM, Karlsruhe Institute of Technology (KIT); Ulrich Spicher, MOT GmbH

Particle number measurement techniques:
PMP particle number counting methodology,
PMP-HD measurement system comparison
Thomas Maier, Georg Wachtmeister, LVK, TU Munich

PRODUCTION + DESIGN II
Chairperson: Prof. Dr. Thomas Maier

Investigation on the tribological behavior of thermally sprayed cylinder liner coatings
Andrei Manzat, Rainer Gadow, IFKB, University of Stuttgart
Chances and risks when using high strength steel sheets  
in structural parts of modern car bodies  
M. Liewald, S. Wagner, R. Radonjic,  
University of Stuttgart, Institute for Metal Forming Technology (IFU)  

Competitive fiber reinforced composite materials for increased  
service temperature usable in exhaust systems  
Patrick Weichand, Rainer Gadow, IFKB, IMTCCC, University of Stuttgart  

SECTION 3  

VEHICLE DESIGN  
Chairperson: Prof. Dr. Lutz Eckstein  

Aerodynamics development of road and racing cars –  
similarities and differences  
Jörg Müller, Jan Monchaux, AUDI AG  

The role of aerodynamics at Mercedes Benz  
Teddy Woll, Daimler AG  

Potentials of virtual chassis development  
Andreas Wagner, AUDI AG  

EMISSIONS I  
Chairperson: Prof. Dr. Georg Wachtmeister  

Advanced systems and trends for powertrain emission measurement  
Kozo Ishida, Masayuki Adachi, Hiroshi Nakamura, HORIBA, Ltd.  

Reduction of engine-out emission and fuel consumption by variable  
EGR distribution in diesel and multi fuel engines  
Yunyu Hu, Thomas Körfer, Thorsten Schnorbus, FEV GmbH;  
Michele Miccio, FEV Italy S.r.l.; Joschka Schaub, RWTH Aachen  

XII
Regeneration control of a LNT via a dynamic NO\textsubscript{2}-Sensor
Bernhard Breitegger, Albert Beichtbuchner, AVL List GmbH; Christian Doppler, Virtual Vehicle Research Center GmbH; Muammer Kilinc, Continental Automotive GmbH; Klaus Hadl, TU Graz

Impact of engine combustion on the reactivity of diesel soot from commercial vehicle engines
Sven Lindner, Alexander Massner, Uwe Gärtner, Daimler AG; Thomas Koch, Institute for Reciprocating Engines, Karlsruhe Institute of Technology (KIT)

POWER SUPPLY NETWORK
Chairperson: Prof. Dr. Klaus Dietmayer

Online thermal monitoring for power semiconductors in power electronics of electric and hybrid electric vehicles
Manuel Warwel, Gerd Wittler, University of Applied Sciences Esslingen; Michèle Hirsch, Robert Bosch GmbH; Hans-Christian Reuss, Institute for Internal Combustion Engines and Automotive Engineering, University of Stuttgart

Control concept for the electrical integration of thermoelectric generators into a vehicle power supply
Jan Hendrik Carstens, Clemens Gühmann, TU Berlin

Breakthrough of an electrically driven air-conditioning compressor due to 48V?
Jan Ackermann, T. Steinmetz, C. Brinkkötter, IAV GmbH; S. Hertel, Consulting4Drive; D. Kettner, A/C Innovations GmbH

48V at Mercedes-Benz – options for further applications
Michael Timmann, Martin Renz, Daimler AG
SECTION 4

ENERGETIC EFFICIENCY
Chairperson: Prof. Dr. Horst E. Friedrich

Pre-development validation of an engine mounted encapsulation approach on SUV vehicle as ‘Eco-Innovation’ by means of EU Regulation 725/2011
D. Petley, W. Jansen, B. Wicksteed, Jaguar Land Rover Cars Ltd;
D. Caprioli, T. Bürgin, Autoneum Management AG

Efficient truck cabin cooling with waste heat during driving and parking
Dirk Neumeister, R. Burk, L. Ludwig, A. Wiebelt,
MAHLE Behr GmbH & Co. KG

Sensitivity analysis on factors influencing the overall rolling resistance of commercial vehicles
Werner Krantz, Jens Neubeck, Jochen Wiedemann,
IVK/FKFS, University of Stuttgart

Evaluation of the energy demand for air conditioning by means of weather and mobility data
A. Basler, F. Freese, P. Megyesi, M. Roth, Dr. Ing. h.c. F. Porsche AG;
F. Gauterin, FAST, Karlsruhe Institute of Technology (KIT)

SOFTWARE PROCESSES
Chairperson: Prof. Dr. Karl-Ludwig Krieger

ISO 26262 for large SW Models
Heiko Doerr, Ingo Stuermer, Model Engineering Solutions GmbH

ODX process from the perspective of an automotive supplier
Dietmar Natterer, Thomas Ströbele, Franz Krauss,
ZF Friedrichshafen AG
From SULEV EAT Concept to ECU software  
Wei Han, Daniel Heß, Olaf Friedrichs, Patrick Stracke,  
Frank Bunar, Stefan Schirmer, IAV GmbH

Powertrain co-simulation on top of standards  
Christoph Störmer, Christoph Malz, Corina Mitrohin,  
Ghizlane Tibba, ETAS GmbH

RAILWAY VEHICLES
Chairperson: Prof. Dieter Bögle

Future diesel engines for rail applications – efficient and low-emission  
Andreas Wegmann, Thorsten Fuchs, Voith Turbo GmbH & Co. KG

DynoTrain – vehicle reaction – track quality –  
contact geometry in realtime  
Thomas Kolbe, R. Kratochwille, DB Systemtechnik GmbH

Road/Rail trucks – very special rail vehicles  
Joachim Feuchter, ZWEIWEG International GmbH & Co. KG

The new light rail vehicle DT8.12 for Stuttgart  
Mathias Jost, Stadler Pankow GmbH