

INDEX – Volume 2

SECTION 1

HYBRID I

Chairperson: Prof. Dr. Christian Beidl

- The potential of 48V HEV in real driving** 1
Mark Schudeleit, C. Sieg, F. Küçükay, IfF, TU Braunschweig
- Online optimization based energy management of hybrid electric vehicles using direct optimal control** 19
Raja Sangili Vadamalu, C. Beidl, TU Darmstadt
- Rapid multi-physics approach to the development of electric drive systems for hybrid and electric vehicles** 37
Christoph Leser, V. Aronovich, R. Hejny, J. Wattleworth
MTS Systems Corporation

LIGHTWEIGHT CONSTRUCTION I

Chairperson: Prof. Dr. Horst E. Friedrich

- Material+energy efficient processing of composites for automotive lightweight parts** 45
Jens Klug, M. Schuck, HBW-Gubesch Thermoforming GmbH
- Forta H-Series – Ultimate lightweight solutions with high strength austenitic materials** 55
Stefan Lindner, Outokumpu Nirosta GmbH
- Fiber reinforced ceramic composites for hot gas and fire retardant applications in automotive** 65
Patrick Weichand, R. Gadow, M. Jiménez, IFKB,
Universität Stuttgart

CHARGING OF ELECTRIC VEHICLES

Chairperson: Prof. Dr. Eric Sax

- Future generations for DC fast charging systems** **73**
Ursel Willrett, IAV GmbH
- Regression test requirements for the charging communication of electric vehicles** **89**
Johannes Unser, Vector Informatik GmbH
- Automated robot-based charging system for electric vehicles** **101**
Bernhard Walzel, C. Sturm, J. Fabian M. Hirz, TU Graz

ENGINES COMPONENTS I

Chairperson: Prof. Dr. Bernhard Geringer

- Inlet swirl throttle for passenger car engines** **115**
Wolfgang Wenzel, U. Hanig, J. Song, BorgWarner, Inc.; B. Bareis, BorgWarner Emission Systems; M. Miclea-Bleiziffer, BorgWarner Turbo Systems
- Crank angle resolved floating-liner friction measurements on microstructured cylinder liner surfaces** **133**
Henning Pasligh, K. Oehlert, F. Dinkelacker, ITV, Leibniz Universität Hannover; H. Ulmer, Bertrandt Ingenieurbüro GmbH
- Technology change towards fully synthetic air filter elements in engine air filtration** **147**
Thilo Müller, T. Batt, M. Heim, A. Pelz, G.-M. Klein, MANN+HUMMEL GmbH

THERMAL MANAGEMENT I

Chairperson: Prof. Dr. Frank Gauterin

Residual heat utilization in vehicles by thermochemical energy storage 161

Peter Hofmann, M. Jakobi, IFA, TU Wien

Holistic thermal management in electric vehicles 181

Srdan Milaković, FKFS, J. Wiedemann, FKFS/IVK, Universität Stuttgart; J. Haug, MAHLE Behr GmbH & Co. KG; M. Hartinger, Robert Bosch GmbH; J. Maué, Daimler AG; J. Rothfuss, sitronic GmbH & Co. KG

Thermal simulation of an electric motor in continuous and circuit operation 205

Stefan Oechslen, A. Heitmann, T. Engelhardt, Dr. Ing. h.c. F. Porsche AG; H.-C. Reuss, FKFS/IVK, Universität Stuttgart

AMBER-ULV – A STORY OF FUTURE LIGHT URBAN ELECTRIC VEHICLES

Chairperson: Gian Mauro Maneia

Introduction to AMBER-ULV and its different business models 219

Michael Stie Laugesen, NTU International A/S, G. M. Maneia, Ce.S.I. Centro Studi Industriali Srl

An innovative energy management system acting on multiple battery packages. 235

TBA

Achievements with model-based development on the innovative traction system of the AMBER-ULV Car 237

Claudio Rossi, D. Pontara, University of Bologna; A. Galli, EOS; P. Fiani, Sherpa Engineering; M. Alirand, Siemens Industry Software

Crash structure design, modelling, virtual sign-off for physical crash testing 253

Gian Mauro Maneia, Ce.S.I. Centro Studi Industriali Srl, R. Papalia, NOVA SRL

SECTION 2

HYBRID II

Chairperson: Prof. Dr. Michael Bargende

- 48 volt technology – More than a mild hybrid** 255
Bernd Mahr, Continental
- Plug-in hybrid by Mercedes-Benz – The technology kit for future consumption targets** 265
Daniel Görke, S. Schmiedler, J. Strenkert, Daimler AG
- Development of simulation test bench (HV-HIL) to calibrate and evaluate hybrid vehicle components without real engine or car** 281
Hikaru Mizuno, R. Elbers, P. Pfeilmaier, Toyota Motorsport GmbH;
T. Naono, H. Oyobe, H. Hanada, K. Shirota, Toyota Motor Corporation;
J. De Smet, Toyota Motor Europe
- Concept solution for efficiency improvement of a powertrain with P2 hybrid technology by an intelligent hybrid control unit** 295
Shen Wang, T. Kersting, M. Rohe, Schaeffler Engineering GmbH;
B. Pennec, Schaeffler Trading (Shanghai) Co. Ltd.

ADAS

Chairperson: Prof. Dr. Klaus Dietmayer

- Validating advanced driver assistance systems (ADAS) using comprehensive, loss-free in-vehicle measurements** 307
Joachim Löchner, J. Wagner, M. Wolter, A. Fernandez,
ETAS GmbH
- Predictive motion cueing algorithm for development of interactive assistance systems** 319
Jürgen Pitz, T. Rothermel, M. Kehler, IVK, Universität Stuttgart;
H.-C. Reuss, FKFS/IVK, Universität Stuttgart
- Safety and security requirements engineering** 335
Christof Ebert, Vector Consulting Services GmbH; M. Brasse, Hella;
E. Metzker, Vector Informatik GmbH

DRIVING DYNAMICS

Chairperson: Prof. Dr. Ferit Küçükay

- Improvements on availability and comfort of electric drives for electric power steering application** **347**
 Nick Trümmel, T. Pötzl, Robert Bosch Automotive Steering GmbH;
 H.-C. Reuss, FKFS/IVK, Universität Stuttgart
- Creation of driving cycles with lateral and longitudinal dynamics for analyzing energy losses in chassis** **363**
 Andreas Schultze, M. Hauck, M. Lienkamp, TU München
- Development of objective criteria to assess the vehicle performance utilized by the driver in near-limit handling conditions of racecars** **377**
 Florian Goy, IVK, Universität Stuttgart; J. Wiedemann, FKFS/IVK, Universität Stuttgart; T. Völkl, G. Delli Colli, AUDI AG; J. Neubeck, W. Krantz, FKFS

ENGINE PROCESS II

Chairperson: Prof. Dr. Horst Harndorf

- Investigation of the mixture formation process with combined injection strategies in high-performance SI-engines** **397**
 Daniel Koch, G. Wachtmeister, LVK, TU München; M. Wentsch, M. Chiodi, FKFS; M. Bargende, FKFS/IVK, Universität Stuttgart; C. Pötsch, Volkswagen AG; D. Wichelhaus, Volkswagen Motorsport GmbH
- Online-methods for engine test bed measurements considering engine limits** **415**
 Benjamin Hartmann, P. Heuser, Bosch Engineering GmbH; E. Kloppenburg, R. Diener, Robert Bosch GmbH
- Simulative development of thermal management for warm-up** **429**
 Björn Meyer, IVK, Universität Stuttgart; M. Bargende, FKFS/IVK, Universität Stuttgart; I. Kutschera, M. Gruber, S.-F. Haas, AUDI AG
- Analysis of working processes and efficiency assessment of hand-held power tools** **445**
 Stephan Meyer, A. Kölmel, T. Gegg, U. Dawin, ANDREAS STIHL AG & Co. KG; P. Piecha, A. Trattner, S. Schmidt, R. Kirchberger, IVT, TU Graz

INJECTION

Chairperson: Prof. Dr. Hermann Rottengruber

Experimental study on the impact of the jet shape of an outward-opening nozzle on mixture formation with CNG-DI 459
Dimitri Seboldt, D. Lejsek, Robert Bosch GmbH; M. Bargende, FKFS/IVK, Universität Stuttgart

3D-CFD analysis on scavenging and mixture formation for CNG direct injection with an outward-opening nozzle 479
Marlene Wentsch, M. Chiodi, FKFS; M. Bargende, FKFS/IVK, Universität Stuttgart; D. Seboldt, D. Lejsek, Robert Bosch GmbH

Penetration path analysis of diesel sprays via spray force measurements 499
Hans Römisch, T. Hergemöller, F.-P. Gulde, Daimler AG; M. Bargende, FKFS/IVK, Universität Stuttgart

Effects of new nozzle hole configurations on air utilization and soot emissions of diesel engines 515
Klaus Hielscher, R. Baar, TU Berlin; M. Brauer, IAV GmbH

AUTOMOBILE & BIG DATA

Chairperson: Dr. Bernhard Budaker

IT architectures for Big Data in the automotive field 535
Jens Jäger, Fraunhofer IPA

Digital realms in production planning – Safety through virtualization 537
Ulrich Odefey, M. Pfeil, V. Fäßler, TWT GmbH Science & Innovation; T. Bär, Daimler AG; H. Zipper, Institut für Automation und Kommunikation e.V. Magdeburg

Big Data in automotive production – Concepts and experiences 549
Thomas Bauernhansl, Fraunhofer IPA

SECTION 3

CHASSIS OF THE FUTURE

Chairperson: Prof. Dr. Jochen Wiedemann

- Honda's philosophy on vehicle dynamics performance and future technology direction** 551
Yasunori Oku, Honda R&D Europe (Deutschland) GmbH
- E-Mobility and driver assistance: Will driving dynamics and driving pleasure stay behind in the future?** 567
Peter Schäfer, U. Reuter, C. Hoffmann, Dr. Ing. h.c. F. Porsche AG
- Automotive game-changers and their challenges from a chassis perspective** 583
Andreas Wagner, AUDI AG

AUTOMATED DRIVING

Chairperson: Prof. Dr. Hans-Christian Reuss

- Safety argumentation for automated driving systems** 601
Michael Helmle, P. Sautter, F. Hauler, F. von Zeppelin, Robert Bosch GmbH
- The Connected Car – A system-of-systems: Exploration of challenges in development from experts view** 603
Armin Kurrle, A. Albers, S. Klingler, IPEK, Karlsruher Institut für Technologie (KIT)
- Connected efficiency – A paradigm to evaluate energy efficiency in tactical vehicle-environments** 615
Jochen Kramer, M. Hillenbrand, K. D. Müller-Glaser, FZI Forschungszentrum Informatik; E. Sax, ITIV, Karlsruher Institut für Technologie (KIT)

THERMAL MANAGEMENT II

Chairperson: Prof. Dr. Stefan Böttinger

Optimization of an engine coolant radiator for vehicle thermal management 629

Lothar Seybold, I. Lazaridis, A. Seryi, W. Filsinger, Adam Opel AG; F. Gruber, B. Taxis, MAHLE Behr GmbH & Co. KG

Simulation in thermal management – Looking back, status and outlook of an exciting discipline 647

Andreas Koller, Dr. Ing. h.c. F. Porsche AG

Design and development of a component test bench for the investigation of automotive ORC systems 659

Holger Mai, D. Nascimento, Kratzer Automation AG; H. Rätz, H. S. Kunte, O. Willers, J. S. Seume, TFD, Leibniz Universität Hannover; S. Weigl, UFT GmbH

ENGINE CHARGING

Chairperson: Prof. Dr. Helmut Eichlseder

The hot side of the new 4-cylinder diesel engine from Mercedes-Benz 679

Jochen Schmid, Daimler AG

Experimental investigation of operating parameters on constant-tone-noise of turbochargers 687

Marco Leonetti, FKFS, M. Bargende, FKFS/IVK, Universität Stuttgart; D. Filsinger, M. Kreschel, IHI Charging Systems International; C. Meier, H. Schulze, Mercedes Benz

Concept for lower raw engine emission covering full engine map operation 707

Mike Lau, R. Suteekarn, Eaton Germany GmbH; G. Lautrich, M. Pannwitz, T. Tietze, IAV GmbH

ENGINES COMPONENTS II

Chairperson: Prof. Dr. Thomas Koch

Fritz Winter ecoCasting: Development of light-weight cylinder crankcases of cast iron 727

Wilfried Wolf, W. Steinberg, Fritz Winter Eisengießerei GmbH & Co. KG

Tailored crankshaft design from early development phase on 739

Julius Perge, VKA, RWTH Aachen University; R. Beykirch, J. Lehmann, M. Gast, FEV GmbH; A. Piccaglia, A. Almini, N. Parenti, VM Motori FCA

Concept for Diesel Particulate Filter monitoring based on BOSCH Particulate Matter Sensor (PMS) 759

Jörg Linke, D. Konrad, Bosch Engineering GmbH

E/E-ARCHITECTURE

Chairperson: Prof. Dr. Karl-Ludwig Krieger

A method to control distributed cause-effect chains of electrical and electronic systems in the field of driving dynamics and driver assistance 769

Matthias Wiese, W. Schröfer, H. Kerscher, M. Hambauer, A. Kron, BMW Group

Cross-domain vehicle control units in modern E/E architectures 783

Waldemar Haas, P. Langjahr, Bosch Engineering GmbH

Intelligent sensor layout of PVDF structure-borne sound sensors to gain signals mechanically 793

Klaas Hauke Baumgärtel, K.-L. Krieger, ITEM, Universität Bremen