CHASSIS.TECH PLUS SECTION

KEYNOTE LECTURES

The all new BMW 7 Series  
Peter Langen, M. Wachinger, Dr. C. Dorrer, W. Nixel, M. Schwarz, BMW Group  

Highly automated driving for commercial vehicles  
Markus Kirschbaum, Daimler AG  

Automated driving, electrification and connectivity – the evolution of vehicle motion control  
Alexander Häußler, Robert Bosch GmbH

CONSUMER PROTECTION AND METHODS

Future consumer protection demands on vehicle safety  
Andreas Rigling, ADAC e.V. Technik Zentrum  

Model-based development methods – What can chassis and powertrain development learn from each other?  
Bernhard Schick, M. Paulweber, AVL List GmbH, Austria
## INDEX

### PARALLEL STRAND I

**NEW CHASSIS SYSTEMS**

**The chassis of the all new Audi Q7**
Carsten Jablonowski, V. Underberg, M. Paefgen, AUDI AG  
37

**Network topology for chassis – potential of ethernet-based systems**
Kristian Trenkel, P. Wunner, iSyst Intelligente Systeme GmbH  
51

**Suspension design of the Visio.M electric research vehicle**
Andreas Schultze, T. Helfrich, Prof. Dr. M. Lienkamp, Institute of Automotive Technology (FTM), TU Munich  
79

### ACTIVE CHASSIS SYSTEMS

**Development of an active motion system of tire contact point control**
Hiroshi Shibuya, H. Iida, H. Kanayama, D. Fujii, X. Carrera Akutain, K. Shima, Toyota Motor Corporation, Japan  
95

**The influence of the modeling depth of active chassis systems with respect to the development stage and their interaction with driving characteristics**
Kilian Dettlaff, Prof. Dr. J. Wiedemann, Institute for Internal Combustion Engines and Automotive Engineering (IVK), University of Stuttgart; U. Schaaf, I. Scharfenbaum, Dr. A. Wagner, AUDI AG  
103

**Smart electromechanical system to improve vehicle handling and stability by toe and camber control on the rear wheel**
Isabel Ramirez Ruiz, Ferrari S.p.A., Italy; Dr. M. Alirand, N. Kieny, Siemens Industry Software SAS, France; Prof. F. Cheli, Politecnico di Milano, Italy  
123
PARALLEL STRAND II

ENERGY EFFICIENCY, SAFETY AND RESOURCES

Tire use and road safety – background to policy recommendations for new EU measures
Sven Jansen, Dr. A. Schmeitz,
TNO Technical Sciences/Automotive, The Netherlands;
L. Akkermans, Transport & Mobility Leuven, Belgium

The influence of wheel and tire aerodynamics in WLTP
Dr. Timo Kuthada, F. Wittmeier, Institute of
Automotive Engineering and Vehicle Engines Stuttgart (FKFS)

Towards a comprehensive approach for the sustainability assessment of a product: product social impact assessment
Dr. Marzia Traverso, P. Tarne, Dr. V. Wagner, BMW Group

DRIVER ASSISTANCE SYSTEMS

A vehicle lateral control approach for collision avoidance by emergency steering maneuvers
Martin Keller, Prof. Dr. Dr. T. Bertram, Institute of
Control Theory and Systems Engineering (RST), TU Dortmund;
Dr. C. Haß, Dr. A. Seewald, TRW Automotive GmbH

Collision avoidance with combined braking and steering
Carlo Ackermann, J. Bechtloff, Prof. Dr. Dr. R. Isermann,
Institute of Automatic Control and Mechatronics (IAT),
TU Darmstadt

Driver assistance for trucks – from lane keeping assistance to smart truck maneuvering
Alexander Gaedke, R. Greul, S. Kanngießer, N. Boos,
Robert Bosch Automotive Steering GmbH
CHASSIS.TECH SECTION

DEVELOPMENT PROCESS

Development of a driving dynamics-oriented suspension design during the early concept phase
Karthik Vemireddy, T. Dittmar, Prof. Dr. L. Eckstein, Institute for Automotive Engineering (ika), RWTH Aachen University; L. Hesse, P. Rettweiler, fka Forschungsgesellschaft Kraftfahrwesen mbH Aachen

Development of a chassis model including elastic behavior for real-time applications
Frédéric Etienne Kracht, Prof. Dr. D. Schramm, Dr. B. Hesse, Chair of Mechatronics, Y. Zhao, Institute for Mechatronics and System Dynamics, University of Duisburg-Essen; Dr. M. Untermüller, Dr. Ing. h.c. F. Porsche AG

Lightweight design in subassemblies with changing design spaces to find an overall weight optimum for series-produced cars
Gerhard Steber, BMW Group; Prof. Dr. R. Lachmayer, Institute of Product Development (IPeG), Leibniz University Hannover

VEHICLE LATERAL DYNAMICS

Objektive Ratingmethode für Handling- und Komfortkriterien für den Einsatz im Fahrversuch und in der Simulation (Objective method for rating ride and handling criteria in simulation and vehicle testing)
Joachim Ecker, Dr. P. Schöggl, E. Bogner, M. Oswald, AVL List GmbH, Austria

Virtual chassis tuning with emphasis on the damper characteristics – a method for optimal integrative damper adjustment by means of vertical and lateral dynamics simulation and evaluation criteria
Florian Klinger, Dr. J. Edelmann, Prof. Dr. M. Plöchl, Institute of Mechanics and Mechatronics, TU Vienna, Austria; S. Jeindl, B. Angrosch, MAGNA Steyr Engineering, Austria

Importance of body rigidity in the transient stage of the maneuver
Charlie Gagliano, Honda R&D Americas, Inc., USA; T. Geluk, Siemens Industry Software NV, Belgium
RIDE COMFORT AND TESTING

Contribution to the objective evaluation of roll dynamics
Andreas Apfelbeck, M. Schwarz, S. Wegner, BMW Group;
Dr. R. Henze, Prof. Dr. F. Küçükay,
Institute of Automotive Engineering (IfF), TU Braunschweig

Improved prediction of ride comfort characteristics
by considering suspension friction in the automotive
development process
Christian Angrick, Prof. Dr. G. Prokop,
Institute for Automotive Technologies Dresden (IAD),
Dresden University of Technology;
Dr. P. Knauer, Dr. A. Wagner, AUDI AG

Endurance tests of electronic suspension for motorcycles –
a system approach
Frederik Harnischmacher, KTM AG, Austria;
Prof. Dr. T. Kuttner, Department of Mechanical Engineering,
University of Federal Armed Forces Munich
STEERING.TECH SECTION

STEERING TECHNOLOGY

Availability and fail-safety approaches for electric power steering systems – trends and requirements
Eberhard Kübler, T. Pötzl, Dr. T. Frenz, J. Sauler, Robert Bosch Automotive Steering GmbH

Innovative software functions to operate electric power steering systems in sports cars – Unterstützungskraftregelung (UKR)
Dr. Christoph Bittner, A. Uselmann, K. M. Krüger, G. Rivera, Dr. Ing. h. c. F. Porsche AG

Steering System Fingerprint – a tool for steering system performance check and overview
Frank Esser, T. Vercammen, Ford-Werke GmbH

TEST BENCH METHODS

Model-based steering ECU calibration on a steering-in-the-loop test bench
Dr. Hans-Michael Koegeler, B. Schick, AVL List GmbH, Austria; Alessandro Contini, Prof. Dr. P. E. Pfeffer, Munich University of Applied Sciences; M. Lugert, T. Schöning, Hyundai Motor Europe Technical Center GmbH

Test infrastructure for EPS steering systems – balancing between requirement-based, experience-based and free testing
Thomas Maur, TRW Automotive GmbH

Realistic dynamic testing of EPS motors and ECUs by means of a hardware-in-the-loop test bench
Hermann Briese, E. Farshizadeh, S. Oedekoven, DMecS Development of Mechatronic Systems GmbH & Co. KG; T. Schubert, Prof. Dr. H. Henrichfreise, Cologne Laboratory of Mechatronics (CLM), Cologne University of Applied Sciences
DRIVING SIMULATION AND TESTING

A simulator study on the controllability of steering systems with reduced maximum steering wheel angle
Christian Dreßler, S. Eßers, TAKATA AG

Implementation and testing of different control strategies on a steer-by-wire research platform
Michele Sigilló, M. Dold, C. Delmarco, K. Polmans, ThyssenKrupp Presta AG, Liechtenstein

Driving quality optimization based on cross-linked cause and effect chain models using the example of energy-efficient steering assistance
Marinette Iwanicki, M. El-Haji, Institute of Vehicle Systems Technology (FAST), T. Freudenmann, Institute of Product Engineering (IPEK), Karlsruhe Institute of Technology (KIT)
## BRAKE.TECH SECTION

### ENVIRONMENTAL ASPECTS AND FUTURE TECHNOLOGIES

**The consequences of a closed rim design for the brakes of a high-efficiency vehicle**
Dr. Ralf Stroph, S. Gielisch, Dr. A. Pruckner, BMW Group

**The contribution of brake emissions to the total vehicle emissions**
Jürgen Lange, R. Steege, D. Welp, TMD Friction Holdings GmbH

**An innovative production method for a C/C-SiC brake disc, suitable for a large-scale production**
Dr. Daisy Julia Nestler, N. Nier, K. Roder, A. Todt, Prof. Dr. B. Wielage, Prof. Dr. G. Wagner, Institute of Materials Science and Engineering (IWW), Prof. Dr. L. Kroll, E. Päßler, Institute of Lightweight Structures (IST), Prof. Dr. S. Spange, J. Weißhuhn, Dr. H. Würfel, Institute of Chemistry, TU Chemnitz

### CONTROL AND SIMULATION

**Combined control strategy for the combustion engine and brake system to enhance the driving dynamics and traction of front-wheel-drive vehicles**
Daniel Killian, Prof. Dr. M. Lienkamp, Institute of Automotive Technology (FTM), TU Munich; S. Fischer, Elektronische Fahrwerksysteme GmbH; S. Poltersdorf, Dr. R. Schwarz, AUDI AG

**Real-time simulation of braking interventions in heavy commercial vehicles**
Dr. Philipp Wagner, T. Ille, Dr. C. Kohrs, MAN Truck & Bus AG; F. Bauer, Institute of Mechanics, University of Federal Armed Forces Munich

**Efficient digital development of brake components with multiple requirements**
Konrad Meister, Dr. Tobias Rößler, Dr. V. Fäßler, Dr. S. Staudacher, TWT GmbH
BRAKE TECHNOLOGY

Electrically controlled parking brake (EPB) for heavy commercial vehicles
Dr. Falk Hecker, T. Weinhold,
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH

Electric parking brake meets drum brake – synergy or contradiction
Christian Breiten, B. Schmittner, Continental Teves AG & Co. oHG

Large aircraft landing gears – a brief overview
Hans-Martin Besch, formerly Airbus Operations GmbH
INDEX

TIRE.WHEEL.TECH SECTION

ROAD SURFACE, TIRE AND WHEEL INTERACTION

Continuous wheel force measurement for passenger vehicles and commercial vehicles  717
Dr. Manfred Kraus, Dr. M. Bäuml,
Schaeffler Technologies AG & Co. KG

Adaptive state observers for driving dynamics – online estimation of tire parameters under real conditions  719
Jakob Bechtloff, C. Ackermann, Prof. Dr. Dr. R. Isermann,
Institute of Automatic Control and Mechatronics (IAT),
TU Darmstadt

Damage on alloy wheels for motor vehicles – limits of rework  735
Thomas Kollmeier, TÜV SÜD Product Service GmbH

SIMULATION

Evaluation of different modeling approaches for the tire handling simulations – analysis and results  749
Francesco Calabrese, Dr. M. Bäcker, A. Gallrein,
Fraunhofer Institute for Industrial Mathematics (ITWM)

Rolling resistance modeling for electric vehicle consumption  775
Andrea Ficht, Prof. Dr. M. Lienkamp,
Institute of Automotive Technology (FTM), TU Munich

The non-steady-state tire model as a set of physical submodels for driver assistance systems analysis  799
Pavel Sarkisov, Prof. Dr. G. Prokop,
Institute for Automotive Technologies Dresden (IAD),
Dresden University of Technology;
Dr. S. Popov, Bauman Moscow State Technical University, Russia
DESIGN AND TESTING

**Evolution of the requirements on vehicle tires and insights from 15 years of test operation**
Lars Netsch, M. Staude, TÜV SÜD Product Service GmbH 815

**Concurrent design of vehicle tires and axles**
Jens Wimmler, Dr. M. Wahle, Dr. M. Zimmermann, BMW Group; Prof. Dr. D. Schramm, Chair of Mechatronics, University of Duisburg-Essen 839

**New testing technology to evaluate lateral ice performance of tires**
Klaus Wiese, J. Heyne, Prof. Dr. B. Wies, T. Neddenriep, Continental Reifen Deutschland GmbH 853
CHASSIS.TECH PLUS SECTION

PLENARY LECTURES

Sense-Plan-Act – the role of chassis systems 867
Ralph Lauxmann, Continental Teves AG & Co. oHG

Consumer acceptance ensured through safety 869
Klemens Schmiederer, TÜV SÜD AG
6th International Munich Chassis Symposium 2015
chassis.tech plus
Pfeffer, P. (Ed.)
2015, XXI, 871 p. 471 illus., Softcover
ISBN: 978-3-658-09710-3