# CHASSIS.TECH PLUS SECTION

## KEYNOTE SPEECHES

### THE CHASSIS OF THE FUTURE

**Automotive development in a process of change**
Prof. Dr. Ulrich Hackenberg, AUDI AG

**Goals and challenges of future chassis developments – solving a multidimensional optimization problem**
Brandon Vivian, General Motors Company, USA; Dr. V. Held, Adam Opel AG

**Driving dynamics of the BMW 2 Series Active Tourer (Die Fahrdynamik des BMW 2er Active Tourer)**
Martin Schuster, M. Schwarz, C. Kilian, K. Huber, A. Schuhmann, BMW Group

## TRENDS IN CHASSIS DEVELOPMENT

**Performance-improved simulator for the quantification of steering feel and vehicle maneuvering**
Dr. Shirou Nakano, JTEKT Corporation, Japan

**Automated driving – Where are we heading?**
Dr. Hans-Peter Hübner, Robert Bosch GmbH
PARALLEL STRAND I

NEW CHASSIS SYSTEMS

918 Spyder – the impulse source for future sports car concepts 35
Georg Wahl, Dr. M. Harrer, Dr. A. K. Zschocke,
Dr. Ing. h.c. F. Porsche AG

The electronic chassis of the new BMW i8 –
influence and characterization of driving dynamics 57
Dr. Christian Wimmer, J. Felten, Dr. D. Odenthal, BMW Group

Direct adaptive steering – independent control of steering force
and wheel angles to improve straight line stability 75
Satoshi Miura, Nissan Motor Co., Ltd., Japan

VEHICLE DYNAMICS TUNING

Universal steering and suspension application with objective,
subjective and virtual methods 91
Dr. Christian Schimmel, W. Wijts, C. Jablonowski, J. Agostini,
AUDI AG

Solution spaces for damper design in vehicle dynamics 107
Markus Eichstetter, C. Redeker, Dr. P. Kvasnicka,
Dr. M. Zimmermann, BMW Group;
Prof. Dr. S. Müller, Department of Motor Vehicles, TU Berlin

CAE-based driving comfort optimization for passenger cars 133
Dr. Friedrich Wolf-Monheim, J. Palandri, Dr. P. Zandbergen,
Ford Forschungszentrum Aachen GmbH;
T. Drotar, Ford Research and Innovation Center, USA
PARALLEL STRAND II

CHASSIS FUNCTIONS

High Integration Platform: a future prospect for chassis functions
Stefan Sollmann, Dr. S. Krause, F. Artmeier, G. Hofstetter, T. Witzmann, Elektronische Fahrwerksysteme GmbH

Torque vectoring as redundant steering for automated driving or steer-by-wire
Kristof Polmans, ThyssenKrupp Presta AG, Liechtenstein; S. Stracke, RWTH Aachen University

Motion control: key element in driver-based and automation-based driving strategies
Dr. Thomas Raste, Dr. P. E. Rieth, Continental Teves AG & Co. oHG

DRIVING SIMULATORS AND DEVELOPMENT METHODS

Active vehicle ride and handling development by using integrated SIL/HIL techniques in a high-performance driving simulator
Marco Fainello, Ferrari SpA, Italy; Diego Minen, VI-grade s.r.l., Italy

Driving simulator application in commercial vehicle development
Dr. Darko Meljnikov, Dr. S. Dronka, L. Noll, Daimler AG

Evaluation of steering feel and vehicle handling in the Stuttgart Driving Simulator (Bewertung von Lenkgefühl und Fahrverhalten im Stuttgarter Fahrsimulator)
Dr. Gerd Baumann, Dr. W. Krantz, J. Pitz, Research Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS); U. Reuter, Dr. Ing. h.c. F. Porsche AG; J. Strecker, ZF Lenksysteme GmbH

STIMULUS ADDRESS

Banking outlook on automotive suppliers – characteristics of a sustainable and successful business model
Jörn Carstens, Thomas Gronemeier, Commerzbank AG
CHASSIS.TECH SECTION

RIDE COMFORT

Air spring damper, on the way to exceptional sliding: modeling, development and optimization of an air spring damper with regard to ride comfort and handling
Willy Armand Fongue, J. Kieserling, Daimler AG;
Prof. Dr. P. F. Pelz, Chair for Fluid System Technology, TU Darmstadt

How subjective evaluation by drivers is affected by car body stiffening – proposal of a hypothetical mechanism
Hitoshi Kyogoku, J. Nakajima, M. Okabe,
Nissan Motor Co., Ltd., Japan;
T. Geluk, F. Daenen, LMS, A Siemens Business, Belgium

Comparability of dynamic chassis measurements with full vehicle tests using the example of a sports car
Sebastian Haberzettl, W. Stein, N. Weijenberg,
Dr. Ing. h.c. F. Porsche AG;
Prof. Dr. F. Gauterin, Institute of Vehicle System Technology (FAST), Karlsruhe Institute of Technology (KIT)

VEHICLE STABILITY

Load problem of lightweight electric vehicles and solution by online model adaptation
Florian Kohlhuber, Prof. Dr. M. Lienkamp,
Institute of Automotive Technology (FTM), TU Munich

Fast identification of a detailed two-track model with onboard sensors and GPS
Jakob Bechtloff, M. Bauer, C. Ackermann, Prof. Dr. Dr. R. Isermann,
Institute of Automatic Control and Mechatronics (iat), TU Darmstadt

The influence of production vehicle dynamics control systems on the yaw stability of car-trailer combinations
Dr. Jonathan Miller, T. Beretta, BMW Group
LIGHTWEIGHT DESIGN AND SYSTEMS

Methodical conception and development
of innovative lightweight chassis systems,
illustrated by the example of the “LEICHT” concept
Andreas Höfer, Prof. Dr. H. E. Friedrich,
Institute of Vehicle Concepts (FK),
Deutsches Zentrum für Luft- und Raumfahrt e. V. (DLR)

Improving the development of sheet structures
with optimization and simulation methods
Sierk Fiebig, J. Sellschopp, A. Rottmann, Volkswagen AG

Schaeffler's electromechanical anti-roll system
Dr. Manfred Kraus, Dr. M. Baeuml,
Schaeffler Technologies GmbH & Co. KG