

# **Global Chassis Control: Challenges and benefits within the networked chassis**

Dr.-Ing. Thomas Raste  
Project Manager Global Chassis and Powertrain Control  
Tel.: 069 7603-4334  
Fax.: 069 7603-3816  
thomas.raste@contiautomotive.com

Dr.-Ing. Peter E. Rieth  
Senior Vice President Technology and Advanced Engineering  
Tel.: 069 7603-2906  
Fax.: 069 7603-3802  
peter.rieth@contiautomotive.com

Continental  
Automotive Systems Division  
Guerickestr. 7  
60488 Frankfurt a.M.

## **Paper Topic**

Chassis system integration

## **Abstract**

Global Chassis Control (GCC) targets in the case of a given configuration of electronically controlled active systems in chassis and powertrain under respective given driving conditions at the global optimization of active safety, driving comfort and driving pleasure. Actual questions and challenges are:

- description of those regions in which the characteristics of a vehicle should be defined by control systems,
- composition of the best possible portfolio of active systems for a certain vehicle,
- development of generic coordination methods and the appropriate tools,
- mapping the control functions onto a certain electronic architecture accentuating the need to reduce complexity.

From the viewpoint of a system supplier these questions will be addressed and the main challenges of control system integration discussed. The global automotive market trends of individualization and emotionalization of vehicle dynamics will also be considered.

The variety of combinations of active chassis systems requests for a generic coordination approach to exploit the full potential and at the same time to reduce the application effort as much as possible. The results of a feasibility study of optimization based coordination of Active Front Steering AFS, Active Rear Axle Kinematics ARK und Active Roll Stabilizer ARS will be presented in the paper for the first time.

The integration of active systems leads to significant improvement in the area of active safety. Today's control systems can reduce dangerous drifts and other lateral instabilities almost completely. The benefits of a range of products including brake, steering, powertrain and suspension systems at the front and rear axle will be demonstrated. On the basis of selected maneuvers with prototype vehicles driven by skilled test drivers in the friction limit range of vehicle dynamics the potential will be highlighted.

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## **Previous papers**

Bauer, R.; Raste, T.; Semmler, S.J.; Rieth, P.E.: Global Chassis Control – Vernetzung am Beispiel ESP und elektronisch regelbares Differenzial. In: AUTOREG 2006, VDI-Berichte Nr. 1931, VDI-Verlag, Düsseldorf, 2006, S. 133 – 141.

Raste, T.; Semmler, S.J.; Rieth, P.E.: Global Chassis Control mit Schwerpunkt auf Hinterradlenkung. In: 15. Aachener Kolloquium Fahrzeug- und Motorentechnik, 9.-11. Oktober 2006, S. 759 – 774.