Source: VDI Wissensforum GmbH

22nd International Conference

Tire – Chassis – Road

Former: Reifen – Fahrwerk – Fahrbahn

Key Topics:

- **Tire Road Interaction**
- **Chassis Design**
- **Tire Wear**
- **Tire Performance**
- **NVH: Optimization and New Ideas**
- **Simulation vs. Reality**

Conference Chair
Prof. Dr.-Ing. Stefan Gies, Automotive Consulting

+ Best Paper Award

+ Evening Event „Experience Technology!“

+ Exhibition

With Experts from:

AdV Automotive Engineering | Applus IDIADA | Auto Mobil Forschung Dresden (AMFD) | Calspan | Continental Reifen | Federal Highway and Transport Research Institute (BASt) | Fors Performance | Fraunhofer ITWM | Goodyear | IAV | Karlsruhe Institute of Technology | MdynamiX | RWTH Aachen University | Trigolign | TU Braunschweig | TU Ilmenau | University of Applied Sciences Kempten | Volkswagen

An event organized by VDI Wissensforum GmbH
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September 15-16, 2025
Esslingen, Germany

Starting from 19:30

Get-together
Evening Reception for Early Arrivers
Sunday, September 14, 2025

Conference Day 1
Monday, September 15, 2025

08:00 Registration

08:45 Welcome and Opening of the Conference
Prof. Dr.-Ing. Stefan Gies, Automotive Consulting

Keynote

09:00 Road Monitoring, Assessment and Analysis – Potentials and Challenges
- Measurement of road surface characteristics of the federal trunk road network
- Optimization of road surface characteristics
- Development of sustainable and resilient road infrastructure – challenges for the future

Dr.-Ing. Ulrike Stöckert, Head of the Highway Construction Technology Department, Federal Highway and Transport Research Institute (BASt), Bergisch Gladbach

Tire Road Interaction
Moderation: **Prof. Dr.-Ing. Thomas Bachmann,** TU Ilmenau

09:30 Multiscale Analysis of Road Textures: Linking High-Resolution Scans, Friction, and Polishing Effects – A Contribution towards a Digital Twin of the Road System
- Multiscale texture analysis
- Asphalt wear simulation
- Friction testing methods

Ventseslav Yordanov, M. Sc., Specialist Intelligent Wheels, Vehicle Dynamics & Acoustics, Co-Authors: Gunnar Böttcher, M. Sc., both of Institute for Automotive Engineering, RWTH Aachen University, Dipl.-Ing. Erik Kamratowsky, TU Dresden

10:00 Influence of Surface Texturing of Concrete Roads on the Groove Wander Effect
- Reasons for Texture Grinding: Comfort, Safety and Sustainability
- Groove Wander Phenomenon: Impact on the driving comfort
- Experimental investigation: Test method on inner drum test bench and results

Marius Staat, Academic Researcher, Institute of Vehicle System Technology, Co-Author: Dr.-Ing. Martin Gießler, both of Karlsruhe Institute of Technology

10:30 Coffee Break and Exhibition Visit

Chassis Design
Moderation: **Dr.-Ing. Thomas Kersten,** Volkswagen AG

11:00 Investigation of Operating Point-dependent, Multiaxial Friction Effects Using a Combined Experimental-analytical Approach in the Context of Virtual Load Data Determination for Battery Electric Vehicle (BEV) Elastomeric Mounts
- State of the art in virtual load data determination of elastomeric mounts for use in multi-body simulation
- Modeling approaches and the complex bushing model
- Friction investigations in the context of model extension and model reduction respectively
- Conclusion

Dipl.-Ing. Florian Kuhl, Project Engineer, Durability and NVH, Auto Mobil Forschung Dresden (AMFD) GmbH, Co-Authors: Dipl.-Ing. Steven Ernst, Prof. Dr.-Ing. Günther Prokop, both of TU Dresden

11:30 Comfort Potential of a Semi-active Anti-roll Bar Based on MR Technology
- Rotary MR-Damper as a controllable link between two passive torsion bar halves
- Variable stiffness of the semi-active anti-roll bar through different input currents and resulting changes in MR fluid viscosity
- Damping effects during one-sided wheel excitations via Rotary MR-Damper
- Improved vertical ride comfort achieved with variable stiffness

Thomas Bertram, B. Sc., Student, Vehicle Dynamics, MdynamiX AG, Benningen, Co-Authors: Prof. Dr. Peter Pfeffer, MdynamiX AG, Benningen/University of Applied Sciences Munich, Stefan Battlog, INVENTUS Development GmbH, St. Anton i. M., Austria

12:00 A Novel Hybrid Conventional/Air Sprung Suspension Concept with High Load Carrying Capacity and Improved Vehicle Dynamics Performance
- Extension of payload capacity
- Novel approach to high payload suspension development
- New metrics for ride-comfort character fingerprinting

Dipl.-Ing. Alex de Vlugt, Senior Vehicle Dynamics Consultant, R&D, AdV Automotive Engineering, Inverleigh, Australia

12:30 Lunch Break and Exhibition Visit

Tire Wear
Moderation: **Dipl.-Ing. Stefan Küster**, Kumho Tire Europe GmbH

14:00 Semi-Trailer Tire Wear: A Practical Study of On-Road Influences for EURO 7
- Projectgoals
- MORE research vehicle
- First research results and outlook
- Follow-up: Setup of practical Semi-Trailer field tests

Matthias Plante, M. Sc., Head of Innovation Management, Trigolign BV, Vaassen, Co-Author: Ad Oomen, M. Sc., HAN University of Applied Sciences, Arnhem, both from the Netherlands

14:30 Parameters Influencing Tire Wear: Current Challenges for Development under the Aspects of New Regulations
- Understanding tire wear phenomena is essential for fulfilling new regulations
- Tire wear is affected by multiple factors, including vehicle, route, pavement and tire
- Modelling approaches for tire wear and influencing factors
- Surface roughness and tire wear

Dr. rer. nat. Pavel Ignatyev, Expert Contact & Friction Physics, Innovation and Applied Research, Co-Authors: Jörg Buschmeier, Dr. Benjamin Oelze, all of Continental Reifen GmbH, Hanover

15:00 Coffee Break and Exhibition Visit

Tire and Brake Wear
Moderation: **Dipl.-Ing. Stephan Rau,** wdk

15:30 Tire and Brake Wear in the Context of Regulatory Requirements and Technical Options for Reducing Emissions
- Measuring methods and fault effect analysis
- Results on tire and brake wear
- Emission levels and mitigation measures

Prof. Dr.-Ing. Thomas Bachmann, Director of Automotive Engineering Group, Department of Mechanical Engineering, Technical University of Ilmenau

16:00 **Future Trends and Mitigation Strategies for Brake and Tire Particle Emissions**

- Euro 7 Hardware Optimization: The initial focus is on enhancing brake friction materials and developing low-wear tires, with electrification and optimized friction materials crucial for compliance
- Future Regulatory Outlook: Anticipated regulations may address airborne tire particle emissions and incorporate RDE standards for non-exhaust emissions
- Advanced Mitigation Strategies: Future approaches may utilize CFD-based methods for particle characterization, alongside wear and emissions models. Model-predictive control strategies offer potential for optimizing vehicle movement

Dr.-Ing. Toni Feißel, Systems Engineer, Research & Development, Co-Authors: Mirco Augustin, Christian März, all of IAV GmbH, Munich

16:30 **Introduction of Esslingen University and Overview of the Evening Event**

Prof. Dr.-Ing. Jens Holtschulze, Faculty Mobility and Technology, University of Applied Sciences, Esslingen

17:00 **End of the 1st Conference Day**

Starting from 17:00 **Get-together Esslingen University**

Get-together at Esslingen University of Applied Sciences with guided tours of a four-post test rig, a tire testing facility, and a VI-grade driving simulator. Take advantage of the relaxed atmosphere to expand your network and have in-depth discussions with other participants and speakers.

Conference Day 2
Tuesday, September 16, 2025

Keynote
Moderation: Prof. Dr.-Ing. Stefan Gies, Automotive Consulting

08:30 **The Volkswagen ID.7 Chassis – Focusing Efficiency and Sustainability**

- Relevance of energy efficiency and sustainability
- Relevant factors on efficiency of automobiles
- Volkswagen's ID.7 chassis
- Chassis contributions to efficiency and the optimization of conflicting targets

Dipl.-Ing. Christoph Weber, Head of Vertical Dynamics, Volkswagen AG, Wolfsburg

Tire Performance
Moderation: Prof. Dr.-Ing. Stefan Gies, Automotive Consulting

09:00 **Measurement of Enhanced Tire Contact Patch Data and Application in Racing Scenarios**

- Enhancement of test procedures to investigate horizontal forces on the (static) footprints
- Influence of camber and inflation pressure on contact behavior
- Lateral load characteristics in Racing scenarios
- Integration of pressure data into tire simulation models

Théo Ferry, M. Sc., Tire Science Leader, Fors Performance, Issoire, France, and **Elaheh Derakhti, M. Sc.,** Research Assistant, Institute for Automotive Engineering, Co-Authors: Benjamin Schäfer, M. Sc., both of RWTH Aachen University, Mark Harris, M. Sc., fka GmbH, Aachen

09:30 **Predicting Tire Performance Across Road Surfaces: A Data-Driven Framework for Adaptive Tire Modeling**

- Replication of real road textures using mathematically generated indoor test surfaces
- Use of 3D road scans to model tire-road interactions across surfaces
- Data-driven mapping from indoor tests to real-world performance
- Validation through vehicle tests and integration into virtual workflows

Dr. Marco Furlan, Senior Modelling Engineer, Tire Research, and **Henning Olsson M. Sc.,** Senior Director, Technology, Automotive, both of Calspan, Buffalo, NY, USA

10:00 **A Targeted Approach to Applying Real Road Macro Texture to Flat-Trac Testing**

- Comparison between laboratory (Flat-Trac) and real road measurements
- A new approach for more realistic tyre-road interaction under controllable boundary conditions
- High-resolution 3D scans for replicas of real road surfaces on tyre laboratory test rigs

Gunnar Böttcher, M. Sc., Research Assistant, Vehicle Dynamics & Acoustics, Institute for Automotive Engineering, RWTH Aachen University, Co-Authors: Christian Carrillo Vasquez, M. Sc., Dr.-Ing. Christian Bachmann, both of fka GmbH, Aachen

10:30 **Coffee Break and Exhibition Visit**

NVH: Optimization and New Ideas

Moderation: Prof. Dr.-Ing. Jens Holtschulze, University of Applied Sciences Esslingen

11:30 Machine Learning Framework for Road Surface Classification: A New Approach to Predict and Reduce Tire-Road Noise

- Noise
- Artificial Intelligence
- Pavement surface characteristics

Sérgio Callai, PhD, Research Group Leader, Institute of Highway Engineering, Co-Authors: Julian Kohlmeier, M. Sc., Prof. Dr. Álvaro Gárcia Hernandez, all of RWTH Aachen University

12:00 Enhanced NVH-MBD Vehicle Modelling with Flexible Rims

- Full vehicle MBD modelling with flexible rim
- Tire/rim interaction
- Hybrid NVH

Dipl.-Ing., Dipl.-Math. Axel Gallrein, Research Engineer, Mathematics for Vehicle Development, Co-Authors: Dr. rer. nat. Manfred Bäcker, both of Fraunhofer-Institut für Techno- und Wirtschaftsmathematik (ITWM), Kaiserslautern, Dipl.-Ing. (FH) Wolfgang Stein, Dr. Ing. h.c. F. Porsche AG, Weissach

12:30 Lunch Break and Exhibition Visit

Simulation vs. Reality

Moderation: Dr.-Ing. Thomas Kersten, Volkswagen AG

13:30 Sensitivity Analysis of MPC-Based Lateral Vehicle Control to Vehicle Load, Road Friction and Tire Changes

- Investigation of the sensitivity of lateral vehicle control to variations in vehicle parameters and environmental conditions
- Simulation of realistic curve-driving scenarios on rural roads
- Identification of critical influencing factors for adaptive control strategies

Jannes Iatropoulos, M. Sc., Research Associate, Institute of Automotive Engineering, Co-Authors: Henrik Münchhausen, M. Sc., Dr.-Ing. Marcel Kascha, Prof. Dr.-Ing. Roman Henze, all of Technical University Braunschweig

14:00 Testing Transformation: Characterization and Design of Next-Generation Proving Grounds for Tire Development

- New Testing Paradigm with the improvement of the Digitalization
- Generation of Input Models, Validation and Calibrations
- Assessment of Unpredictable Tire Characteristics and Operating Conditions
- New Challenges: Monitoring / Manufacturing of Test Tracks

Phillipe Cornu, Principal Engineer, Global Performance & Simulation, Goodyear, Colmar-Berg, Luxembourg

Panel Discussion "Pros and Cons of Tire Models"

14:30 Impulse presentations:

FTire vs MFTire: A Comparison of the Evaluability of Vehicle Dynamics on a Dynamic Driving Simulator Depending on the Tire Model Type

- Support virtual car development
- Compare empirical (MFTire 5.2) vs. physical (FTire) tire models on a driving simulator
- Simulator and real-world tests assess realism and vehicle dynamics

Prof. Bernhard Schick, Head of Institute, Institute for Driving Assistance and Connected Mobility, Co-Author: Philipp Rupp, both of University of Applied Sciences Kempten, Benningen

Bridging Simulation and Track: Improving Driver Perception on Simulator Through Physical Tire Modeling

- Physical tire model vs Parametric tire model
- Virtual Tire Performance in Real Time Driving Simulator
- Subjective evaluation Real Vehicle vs Virtual Vehicle
- Limit Handling Non-Linear behavior

Dr. Eduardo Martano, Project Engineer, Vehicle Dynamics and Tire Characterization, Applus IDIADA, Santa Oliva, Tarragona, Spain, Co-Author: Dr. Benjamin Rieff, cosin scientific software AG, Munich

15:00 Best Paper Award & Closing Words

15:15 End of Conference

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Best Paper Award

The best presentation by a young scientist (max. 33 years of age) will be honored with the Best Paper Award of the conference "Tire – Chassis – Road". The prize is endowed with 500 EUR and can only be accepted in person at the end of the conference.

VDI Wissensforum

22nd International Conference
Tire – Chassis – Road

High-level Discussions on the Latest Trends, Developments and Perspectives

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