

INFORMATION



Forschungsinstitut für
Kraftfahrwesen und
Fahrzeugmotoren
Stuttgart



11. FKFS CONFERENCE

PROGRESS IN **VEHICLE
AERODYNAMICS AND
THERMAL MANAGEMENT**

**26TH – 27TH
SEPTEMBER 2017**
FKFS
UNIVERSITY OF STUTT GART

»» 11TH FKFS CONFERENCE

Progress in Vehicle Aerodynamics and Thermal Management

The FKFS-Conference is an ideal location to get latest information about new car developments, new or improved testing techniques and new or improved calculation procedures. It is an ideal forum to meet leading experts from industry, universities and other institutions, to exchange ideas and discuss new ones. Furthermore, demonstrations will show the state of the art in measurement technology applied live in FKFS Wind Tunnels and Laboratories.

»» DATE

26th September 2017 | 8:00 – 22:30
27th September 2017 | 9:00 – 16:00

»» LOCATION

Haus der Wirtschaft | Willi-Bleicher-Straße 19 | 70174 Stuttgart | Germany

»» ORGANIZED BY

FKFS – Research Institute of Automotive Engineering
and Vehicle Engines Stuttgart

Scientific Management:
Prof. Dr.-Ing. Jochen Wiedemann,
Dr.-Ing. Jorg-Dieter Vagt

»» CONTACT

EMENDO Event & Congress
Phone: +49 711 4605376-11
info@fkfs-conference.de

»» LECTURES

Bertha-Benz-Saal (1st floor)

»» TECHNICAL EXHIBITS

Suppliers of engineering services, measurement equipment and components present their latest developments in the Meidinger-Saal.

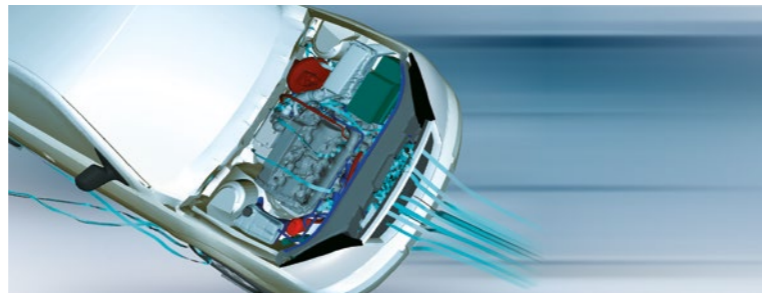
26th September 2017 | 8:00 – 15:30
27th September 2017 | 9:00 – 14:00

»» HOTEL

Stuttgart-Marketing GmbH | Rotebühlplatz 25 | 70178 Stuttgart
Phone +49 711 2228-100 (Mon – Fri | 9:00 – 17:00)
Fax +49 711 2228-251, hotels@stuttgart-tourist.de

www.stuttgart-tourist.de/fkfs2017

Reservation-Code: FKFS



»» REGISTRATION FEE

- » Access to all lectures on both days
- » Conference documentation
- » Lunch, cold drinks and coffee at break times
- » Access to the formal evening reception on 26th September 2017 (excluded Students)

Participants

» Conference (26th – 27th September 2017) 950 € + 19% VAT

Students

» Student 119 € incl. VAT

For students of the **University of Stuttgart** a limited number of free tickets are available. Please send us a copy of your student card to info@fkfs-conference.de.

Sign up now: fkfs-conference.de/registration

»» REGISTRATION

The registration desk is located in the foyer of Meidinger-Saal on the 1st floor.

Opening times:

Tuesday 26th September 2017 | 8:00 – 15:30
Wednesday 27th September 2017 | 8:30 – 14:00



»» EVENT WEBSITE



www.fkfs-conference.de

»» REGISTRATION



Start on 20th March 2017
fkfs-conference.de/registration



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WELCOME

The individual freedom given by a personal road vehicle is likely to continue. It is still an important attribute of our life. In response to the environmental challenges the incentives to improve the efficiency of road vehicles are strong and continuously growing.

Following the recent discussions related to emissions the electrification of cars seems to be the principle path of future development processes. Despite of several specific aero/thermal concerns for electrically driven vehicles the overall aerodynamic issues for both electric cars and conventional ones are similar. However, it should not be forgotten that the efficiency of aerodynamic measures is enhanced in the case of electric powertrains because of possible regenerative braking.

Consequently, continuous reduction of driving energy for road vehicles remains the main task without forgetting passenger comfort, driving stability and thus safety, internal/external noise generation and thermal management.

The main topics of this year's conference are on new vehicles, new on-road and new cooling/thermal management results with a special focus on unsteady aerodynamics.

Usually, the aerodynamic development process of vehicles in wind tunnels relies on steady state conditions disregarding any unsteady aerodynamics present on the road. Low turbulence-intensity flow and fixed test objects at zero degree to the wind are the main boundary conditions.

On the road the vehicle almost never experiences these conditions and thus, more and more attention is paid to reduce the gap between steady state wind tunnel results and later behavior under real conditions. To diminish this gap, tools and methods are discussed nowadays to install or improve simulation techniques in wind tunnels. Achieving early information or predictions on car handling will reduce the development process considerably.

Joining the FKFS-Conference is an ideal opportunity to meet experts from industry, universities or other institutions, to exchange new ideas and learn about the latest developments, methods and tools.

Traditionally, as a unique feature, the FKFS-Conference offers live demonstrations showing measurement technologies applied in the FKFS wind tunnels and laboratories.

PROGRAM

» TUESDAY, SEPTEMBER 26TH, 2017

8:00 Registration

9:00 Welcome and Introduction
Jochen Wiedemann, FKFS

KEYNOTE

9:15 Becoming a vehicle aerodynamicist in China
Zhigang Yang, Tongji University

SESSION 1: THERMAL MANAGEMENT

Chairman: Thomas Schütz, BMW Group

10:00 A coupled simulation approach to race track brake cooling for a GT3 race car
Sacha Jelic, Will Hunt, Adam Price, Vianney Staelens, Muhammad Saif Ul-Hasnain, Exa Corporation

10:30 A new process to evaluate the risk of an engine power drop caused by snow particles
Christoph Huber, Daimler AG

11:00 Coffee Break

SESSION 2: COOLING AIR FLOW

Chairman: Andreas Kremheller, Nissan Technical Centre Europe

11:30 Introduction of a new Full-Scale Open Cooling Version of the DrivAer Generic Car Model
Burkhard Hupertz, Ford Motor Company; Lothar Krüger, Ford of Europe; Neil Lewington, Ford Asia Pacific; Christopher Collin, Technical University of Munich; Timo Kuthada, FKFS

12:00 An experimental investigation into the flow mechanisms around an SUV in open and closed cooling air conditions
John Pitman, Jaguar Land Rover

12:30 Lunch



SESSION 3: UNSTEADY FLOW

Chairman: Michael Pfadenhauer, Dr. Ing. h.c. F. Porsche AG

13:45 Evaluation of Unsteady Flow Phenomena Induced by the Tailgate Gap of a Production Car Using Simulation and Experiment
Georg Eitel-Amor, Sascha Riedl, Reiner Weidemann, Adam Opel AG

14:15 Characterisation of wake bi-stability for a square-back geometry with rotating wheels
Giancarlo Pavia, Martin Passmore, Loughborough University

14:45 Investigation of Time-Resolved Nozzle Interference Effects
Christoph Schönleber, FKFS

15:15 Introduction into Demonstrations
Timo Kuthada, FKFS

15:30 Transfer to FKFS

16:10 Demonstrations
» *FWK: Unsteady Aerodynamics: Noise Modulation due to Unsteady Incoming Flow*
» *MWK: Flow Field Measurements: Tomo PIV*
» *TWK: Vehicle Soiling: Influence of Contact Angle*
» *Acoustic Lab: Anechoic Chamber: Determination of Side Window Sound Transmission Characteristics*
» *Rennteam Uni Stuttgart e.V.: Aerodynamics*
» *C. Seat LaB: Comfort Seat Lab*

Coffee Break between the Demonstrations

18:30 Buffet Dinner

22:30 End

The **Demonstrations and the Evening Event** are located at the FKFS - Pfaffenwaldring 12, 70569 Stuttgart. A transfer is available.



PROGRAM

» WEDNESDAY, SEPTEMBER 27TH, 2017

9:00 Warm-Up
Jorg-Dieter Vagt

SESSION 4: NEW VEHICLES

Chairman: Atsushi Ogawa, Honda R&D Co., Ltd.

9:15 Mercedes AMG GTR: Aerodynamics for the Record
Gustavo Estrada, Mercedes-AMG GmbH

9:45 The Aerodynamics Development of the new Land Rover Discovery 5
Sébastien Chaligné, Ross Turner, Adrian Gaylard, Jaguar Land Rover

10:15 The aerodynamic development of the new Volkswagen Polo
Mathias Hähnel, Carsten Repmann, Volkswagen AG

10:45 Coffee Break

SESSION 5: ON-ROAD TESTS

Chairman: Adrian Gaylard, Jaguar Land Rover

11:15 Aerodynamic development of a new coach generation based on windtunnel testing, CFD-simulation and on road tests
Marius Hellmold, Stephan Kopp, MAN Truck & Bus

11:45 An Experimental Study of the Under-Floor Flow of a VW Golf 7 under On-Road and Wind-Tunnel Conditions via Particle Image Velocimetry
Johannes Haff, Sven Lange, Henning Wilhelmi, DLR Institut für Aerodynamik und Strömungstechnik

12:15 Some aspects on On-Road Aerodynamics
Thomas Schütz, BMW Group

12:45 Lunch

SESSION 6: AERODYNAMIC DEVELOPMENT

Chairman: Teddy Woll, Daimler AG

14:00 On the Influence of Underhood Flow on External Aerodynamics of the DrivAer Model
Christopher Collin, AUDI AG

14:30 Potential of Porsche reference cars for aerodynamic development
Francesca Cogotti, Michael Pfadenhauer, Thomas Wiegand, Dr. Ing. h.c. F. Porsche AG

15:00 Methodical investigation of vehicle side glass soiling phenomena
Thomas Landwehr, IVK, Universität Stuttgart; Timo Kuthada, FKFS; Jochen Wiedemann, FKFS/IVK, Universität Stuttgart

15:30 Design and First Test of the New Synchronous 200Hz System for Unsteady Pressure Field Measurement
Jakub Filipický, Jan Gížek, 4Jtech s.r.o.; Timo Kuthada, Felix Wittmeier, FKFS/IVK, Universität Stuttgart

16:00 Farewell
Jochen Wiedemann, FKFS