Symposium for Combustion Control
June 17th-18th, 2015
Novotel in Aachen, Germany

Program
In the last decades, increasing demands to reduce fuel consumption and exhaust emission arose and led to a variety of new concepts to improve combustion engines. Most of these approaches require efficient closed-loop control, detailed physical models, powerful control logics and innovative sensor concepts.

The annual Symposium for Combustion Control covers the continuously rising relevance of these topics. Moreover it improves the interaction between the scientific community and the automotive industry and enables the exchange of knowledge in combustion control.

Due to its high reputation among researchers and the industry Aachen is an excellent venue for the Symposium for Combustion Control with its focus on latest industrial and theoretical developments in the control of combustion engines.

Organizers

Welcome and Opening

08:15 Welcome and Opening by the Organizing Professors

Keynote Speech

DENSO’s View for Combustion Control Technology Improvement Direction
Masato Nakagawa
Chief Technology Officer
DENSO INTERNATIONAL EUROPE

Gas Engines

09:00 Optimal Actuator Placement for Two-Stage Turbocharged Gas Engines
R. Burgmair, P. Srinivasan - GE Global Research
O. Sarmiento - Continental AG
J. Huber - UMIT GmbH

09:30 Model-Based Control Development for Natural Gas-Diesel RCCI
F. Willems, C. Bekdemir; A. Indrajuana,
E. Doosje
TNO Automotive

10:00 Insight into the Combustion Control of WinGD 2-Stroke Dual-Fuel Dual-Combustion Engines
P. Rebecchi, P. Scrocco, M. C. Signorile,
S. K. Nanda, M. Ott
Winterthur Gas & Diesel Ltd.

10:30 Break
Modeling
11:00  Detailed Driving Cycle Simulation with Applied Phenomenological Combustion and Emission Modeling
C. Hasse - NTFD, TU Freiberg
M. Dorsch, J. Neumann - BMW Group

11:30  Simulation of Mega-Knock Probability in Highly Boosted Direct Injection SI Engines
K. G. Stapf - Ingenieurbüro TWB
G. Paczko, N. Peters
ITV, RWTH Aachen University

12:00  Reduced Order Combustion Model for a Virtual Control Testbed of a PCCI Diesel Engine
B. Jochim, M. Korkmaz, H. Pitsch
ITV, RTWH Aachen University
R. Zweigel, D. Abel
IRT, RWTH Aachen University

12:30  Lunch

Auto-Ignition / Pre-Ignition
14:30  Quasi-Global Kinetic Modeling of Autoignition of Fuels
K. A. Heufer - PCFC, RWTH Aachen University

15:00  Real-Time Low Speed Pre-Ignition Detection Using Cylinder Pressure Sensor
F. Videl-Naquet, T. Leroy
IFP Energies nouvelles

15:30  Potential of In-Cycle Combustion Control for the Auto Ignition Process of Gasoline Engines
B. Lehrheuer, R. Savelsberg, J. Andert
VKA, RWTH Aachen University
M. Thewes - FEV GmbH

16:00  Break

Injection Technology
16:30  The Next Generation of Common Rail Injector - Steps to Control Diesel Combustion in Time and Space
J. Weber, J. Ruwe, J. Kiyanni, N. Sashima, J. Hagen
DENSO Automotive Deutschland GmbH

17:00  A Lean-Burn Combustion System Enabling High Efficiency and Reduced Emissions
H. Blaxill, M. Bunce
MAHLE Powertrain LLC

17:30  Combustion Phase Control with Multiple-Pulse Fuel Injection
X. Luo, F. Willems, B. de Jager
Eindhoven University of Technology

19:30  Dinner
Dinner on 17.06.2015

19:30 Reception and Welcome
The dinner will take place at the restaurant LivingRoom close to the historical city hall. The dinner is free of charge for attendees. The fee for accompanying persons is € 50.

Address:
LivingRoom
Büchel 22
52062 Aachen
+49 241 21131
www.livingroom-aachen.de

Keynote Speech
08:30 On Model-Based Combustion Engine Control Systems
Prof. Dr.-Ing. Dr. h.c. Rolf Isermann
Head of the Research Group for Control Systems and Process Automation
Darmstadt University of Technology

Model-Based Control
09:15 Robust Model-Based Feedback Control Strategy for the EGR and Intake Throttle Air Path System in a Diesel Engine
M. Rubensson - Volvo Car Corporation

09:45 Model-Based Air Path Control for Two-Stage Turbocharged Gasoline Engines
D. Ritter, T. Albin, F. Frank, D. Abel
IRT, RWTH Aachen University
N. Liberda, S. Pischinger
VKA, RWTH Aachen University

10:15 Model-Based Air Path Control for Partial Homogeneous Diesel Combustion
C. Auerbach, P. Skarke, M. Bargende
IVK, Stuttgart University
H.-J. Berner
FKFS Forschungsinstitut für Kraftfahrwesen und Fahrzeugmotoren Stuttgart

10:45 Break
### Combustion Systems

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<th>Time</th>
<th>Topic</th>
<th>Authors/Institutions</th>
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| 11:15  | Engine Control Concept for Efficient Reduction of CO₂ Emissions under Real Driving Conditions | B. Segtrop, H.-G. Nitzke - Volkswagen AG  
A. Kecskeméthy - University of Duisburg-Essen                                      |
| 11:45  | Gas Condition Dependent Combustion Control for Optimal Dynamic Diesel Engine Operation | S. Zydek, R. Isermann  
Darmstadt University of Technology                                                    |
| 12:15  | Model-Based Predictive Combustion Control - Vehicle Demonstration   | P. Fussey  
Ricardo UK and The University of Oxford                                                |
| 12:45  | Physical-Based Engine Control for Higher Robustness and Better Fuel Consumption of Diesel Engines under RDE Conditions | T. Schnorbus, J. Schaub, M. Miccio, D. Lorei  
FEV GmbH                                                                              |
| 13:15  | Lunch                                                                 |                                                                                     |

### Embedded Control Units

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| 14:15  | Advanced RCP Solutions for In-Cycle Control of Combustion Engines    | L. Juhász, F. Schütte, D. Berneck, J. Lakemeier  
dSPACE GmbH                                                                           |
| 14:45  | Cylinder Pressure-Based Functions: Overview, Benefits and Algorithm Considerations | S. Mannal, R. Saracino, G. Totto, A. Nitti, N. Ludewig, S. Motz, M. Krüger  
Robert Bosch GmbH  
S. Camporeale - Politecnico di Bari                                                     |
J. Mauss - QTronic GmbH  
M. Simons - Daimler AG                                                                 |
| 15:45  | Alternative Variable-Camshaft-Based Knock-Control Using a Flexible Test-Bench Controller | M. Reke, T. Wolter - VEMAC GmbH & Co. KG  
J. Neugärtner  
VKM, Kaiserslautern Technical University                                                |
| 16:15  | Final Remarks and End of the Symposium                               |                                                                                     |
**Registration**

Please register for the Symposium for Combustion Control at:
www.scc.rwth-aachen.de

**Payment**

The registration fee of € 650 (plus 19% VAT) also includes the dinner on June 17th and the proceedings. Your registration will be confirmed by the invoice which will be sent to you. Registration is completed after receipt of payment.

Please note that in case of cancellation prior to 15.05.2015, the participant’s fee will be reimbursed (less € 65 exclusive of 19% VAT for administrative costs). After that, the participant’s fee cannot be reimbursed.

**Hotel Reservation**

For special rates at the Novotel, please book only by phone:
Phone: +49 241 5159-100
Password: Symposium for Combustion Control

Further hotels can be found:
http://www.aachen-tourist.de/hotels
Phone: +49 241 18029-50

**Parking**

We recommend to use the Novotel underground car park.


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**Attendees**

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**Venue**

Novotel Aachen City
Peterstraße 66, 62062 Aachen, Germany
Phone: +49 241 51590
www.novotel.com
Symposium for Combustion Control