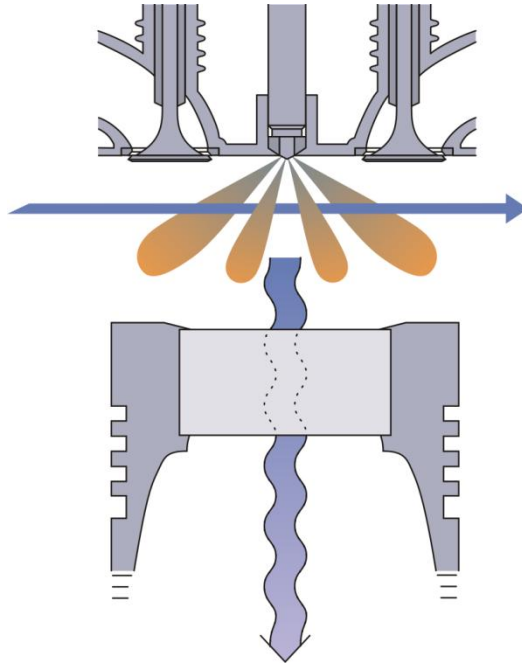


Book of Abstracts



Seventh International Symposium

Towards Clean Diesel Engines

TCDE 2009

June 4-5, 2009 AGIT Technology Center, Aachen, Germany



Program – Day 1: Thursday, June 4, 2009

08:30	Registration	
09:00	Opening	

Session 1: Diagnostics		Page
Chair: C. Schulz		
09:15	Invited lecture: Detailed analysis of mixture and combustion of Diesel jets by laser-induced fluorescence G. Bruneaux Engine System Analysis Department, IFP, France	1
10:00	Coffee break with poster discussion, presentation of posters 1-3	
10:30	Studies of DI Diesel engine cold start combustion in an optical engine J.M. Desantes, J.V. Pastor, J.M García-Oliver, J.G. Ramírez-Hernández Institute for Thermal Engines, Polytechnic University of Valencia (UPV), Spain	7
10:55	In-cylinder chemical species tomography for CI engines H. McCann, E.M. Cheadle, J.L. Davidson, K.B. Ozanyan, N. Terzija, P. Wright School of Electrical & Electronic Engineering, Univ. of Manchester, Manchester, UK	11
11:20	In-cylinder imaging diagnostics with highly efficient UV-transparent endoscopes C. Gessenhardt ¹ , R. Reichle ² , C. Pruss ² , W. Osten ² , C. Schulz ¹ ¹ IVG, University of Duisburg-Essen, Duisburg, Germany; ² ITO, University of Stuttgart, Stuttgart, Germany	15
11:45	Swiss Light Source VUV beamline, Imaging photoelectron photo-ion coincidence spectroscopy A. Bodi, M. Johnson, T. Gerber Molecular Dynamics, Paul Scherrer Institute, Villigen/PSI, Switzerland	19
12:10	Studies of Ter-Butyl-Peroxy and Hexadiyne by dispersed fs-FWM methods G. Knopp, P. Radi, A. Bodi, M. Johnson, T. Gerber Molecular Dynamics, Paul Scherrer Institute, Villigen/PSI, Switzerland	23
12:35	Lunch break	

Session 2: Modeling and Control		Page
Chair: N. Peters		
14:00	Invited lecture: Development and use of LES for Diesel engine CFD C.J. Rutland Engine Research Center, University of Wisconsin, Madison, USA	27
14:45	Evaluation of CI in-cylinder flow using optical and numerical techniques R. Rezaei ¹ , S. Pischinger ¹ , P. Adomeit ² , J. Ewald ² ¹ Institute for Combustion Engines, RWTH Aachen University, Germany ² FEV Motorentechnik GmbH, Aachen, Germany	33
15:10	A dynamic PCCI combustion model for Diesel engine control design C. Felsch ¹ , K. Hoffmann ² , A. Vanegas ¹ , P. Drews ² , T. Albin ² , S. Abel ² , N. Peters ¹ ¹ Institute for Combustion Technology, RWTH Aachen University, Aachen, Germany; ² Institute for Automatic Control, RWTH Aachen University, Aachen, Germany	37
15:35	Coffee break with poster discussion, presentation of posters 4-7	
16:05	Development of A clean Diesel combustion system by engine testing and CFD simulation J.Weber ¹ , G. Thuir ¹ , H. Schwab ¹ , S. Saeki ² , G. Kotnik ³ , K. Wieser ³ , P. Gutmann ³ , P. Matthis ³ ¹ DENSO Automotive Dtl. GmbH, Aachen Engineering Center, Germany; ² DENSO Cooperation, Japan; ³ AVL List GmbH, Austria	41
16:30	Flamelet-generated manifold strategies in modeling of an igniting Diesel spray C. Bekdemir, L.M.T. Somers, L.P.H. de Goey Dept. of Mechanical Engineering, Eindhoven Univ. of Technology, The Netherlands	45
16:55	End of Session 2	
	Lab Tour VKA, Aachen	
19:30	Conference Dinner	

Program – Day 2: Friday, June 5, 2009

Session 3: Chemistry and Bio-fuels		Page
Chair: J.J. ter Meulen		
09:15	Invited lecture: Is gasoline the best fuel for advanced diesel engines? – Fuel effects in "premixed-enough" compression ignition (CI) engines G. Kalghatgi Shell Global Solutions, Chester, UK	49
10:00	Detailed chemical kinetic modelling of aromatic Diesel fuel components R.P. Lindstedt, V. Markaki and R.K. Robinson Department of Mechanical Engineering, Imperial College London, UK	55
10:25	Coffee break with poster discussion, presentation of posters 8-11	
10:55	Invited lecture: Potentials and challenges of tailor-made fuels from biomass S. Pischinger Institute for Combustion Engines, RWTH Aachen University, Germany	59
11:40	Biodiesel soot incandescence and NO emission studied in an optical engine R.J.H. Klein-Douwel ¹ , A.J. Donkerbroek ¹ , A.P. van Vliet ¹ , M.D. Boot ² , L.M.T. Somers ² , R.S.G. Baert ^{2,3} , N.J. Dam ¹ , J.J. ter Meulen ¹ ¹ Applied Molecular Physics, Radboud University Nijmegen, The Netherlands; ² Mechanical Engineering, Eindhoven University of Technology, The Netherlands; ³ TNO Automotive, Helmond, The Netherlands	65
12:05	HCCI operation of an optically accessible Diesel engine fuelled with RME fuel E. Mancaruso, B.M. Vaglieco Istituto Motori, CNR, Naples, Italy	69
12:30	Soot reduction from the combustion of 30% rapeseed oil blend in a HSDI Diesel engine L. Labecki, L.C. Ganippa Centre for Advanced Powertrain and Fuels Research, School of Engineering and Design, Brunel University, West London, UK	73
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Session 4: Injectors and Sprays		Page
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14:30	Invited lecture: Directly actuated piezo injector for advanced injection strategies towards cleaner diesel engines O. Kastner Continental Automotive, Germany	77
15:20	3D-CFD in-nozzle flow simulation and separate row injection rate measurement as preparatory steps for a detailed analysis of multi-layer nozzles C. Menne ¹ , A. Janssen ¹ , M. Lamping ² , T. Körfer ² , H.-J. Laumen ² , M. Douch ² , R. Meisenberg ² ¹ Institute for Combustion Engines, RWTH Aachen University, Aachen, Germany; ² FEV Motorentechnik, Aachen, Germany	83
15:55	Coffee break with poster discussion	
16:15	Optical investigations of clustered Diesel jets under quiescent conditions M. Cardenas ¹ , P. Hottenbach ² , R. Kneer ¹ , G. Grünefeld ² ¹ Institute of Heat and Mass Transfer, RWTH Aachen University, Germany; ² Institute for Laser Diagnostics in Thermo-Fluid Dynamics, RWTH Aachen University, Germany	87
16:40	Spray growth of regular, synthetic, oxygenated and biodiesels in an optical engine R.J.H. Klein-Douwel ¹ , A.J. Donkerbroek ¹ , C.C.M. Luijten ² , M.D. Boot ² , L.M.T. Somers ² , N.J. Dam ¹ , J.J. ter Meulen ¹ ¹ Applied Molecular Physics, Radboud University Nijmegen, The Netherlands; ² Mechanical Engineering, Eindhoven University of Technology, The Netherlands	91
17:05	Final remarks	
17:15	End of Session 4	
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Contributed Posters

1	Probing the heat during the PCCI beat: Determining PCCI engine temperatures using two-line thermometry J.R. Mannekutla, J.C.C.M. Huijben, A.J. Donkerbroek, A.P. van Vliet, L. Gerritsen, N.J. Dam, J.J. ter Meulen Applied Molecular Physics, Radboud University Nijmegen, The Netherlands;	97
2	Simulation of primary breakup for Diesel spray with phase transition P. Zeng ¹ , B. Binninger ¹ , P. Peters ¹ , M. Herrmann ² ¹ Institute of Combustion Technology, RWTH Aachen University, Aachen, Germany; ² Department of Mechanical and Aerospace Engineering, Arizona State University, Tempe Arizona, USA	101
3	Auto-ignition of aromatic and aliphatic Diesel fuel components: High-pressure shock-tube experiments and kinetic modeling for toluene and n-heptane M. Hartmann ¹ , I. Gushterova ² , R. Schießl ² , U. Maas ² , C. Schulz ¹ ¹ IVG, University of Duisburg-Essen, Duisburg, Germany; ² ITV, University of Karlsruhe, Karlsruhe, Germany	103
4	A cluster nozzle concept with high injection pressures for DI Diesel engine N. Peters, H. Won Institute for Combustion Technology, RWTH Aachen University, Aachen, Germany;	107
5	Degenerate and two-color resonant four-wave mixing of C₂ in a molecular beam environment M. Tulei ¹ , P.P. Radi ² , G. Knopp ² , T. Gerber ² ¹ Physics Institute, Space Research & Planetary Sciences, University Bern, Bern, CH; ² Molecular Dynamics, Paul Scherrer Institut, Villigen/PSI, CH	111
6	The large-engine research facility at PSI K. Hoyer ¹ , P. Dietrich ¹ , M. Dettwyler ² ¹ General Energy Research Department, Paul Scherrer Institut, Villigen, Switzerland; ² Kistler Intrumente AG, Winterthur, Switzerland	115
7	Recent developments in laser-induced incandescence (LII) for soot diagnostics in high-pressure laminar flames and engine-like Diesel combustion M. Hofmann, B. Kock, T. Dreier, C. Schulz IVG, University of Duisburg-Essen, Duisburg, Germany	117
8	Fuel formulation and mixing strategy for rate of heat release control with PCCI combustion R.P.C. Zegers, M. Yu, C.C.M. Luijten, N.J. Dam, R.S.G. Baert, L.P.H. de Goey Dept. of Mechanical Engineering, Eindhoven Univ. of Technology, The Netherlands	121
9	Experimental and Numerical Investigation of Injection Rate Shaping in a Small-Bore Direct-Injection Diesel Engine V. Luckhchoura ^{1*} , F. -X. Robert ¹ , N. Peters ¹ , M. Rottmann ² , S. Pischinger ² ¹ Institute for Combustion Technology, RWTH Aachen University, Aachen, Germany ² Institute for Internal Combustion Engines, RWTH Aachen University, Aachen, Germany	125
10	Simulation of Lifted Diesel Sprays using a newly developed Combined Level-set Flamelet Model S.Vogel*, N.Peters Institute for Combustion Technology, RWTH Aachen University, Aachen, Germany	129
11	Experimental Analysis of the effect of very early pilot injection on pollutant formation for a PCCI Diesel engine A. Vanegas*, N. Peters Institute for Combustion Technology, RWTH Aachen University, Aachen, Germany	133

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