

Contents

Keynote Papers

Peter Bearman

Bluff Body Flow Research with Application to Road Vehicles3

David Schimel

Climate Change and the Energy Economy 15

Flow Field Characteristics

G. Iaccarino, F. Ham, Y. Khalighi, D. Bodony, P. Moin, B. Khalighi

Large Eddy Simulations and Acoustic Predictions in Automotive Applications 19

B. Khalighi, S. Jindal, J.P. Johnson, K.H. Chen, G. Iaccarino

Validation of the Immersed Boundary CFD Approach for Complex Aerodynamic Flows 21

B. Khalighi, J.P. Johnson, K.-H. Chen, R.G. Lee

Experimental Characterization of the Unsteady Flow Field behind Two Outside Rear-View Mirrors39

P. Merati, C.H. Leong, K.H. Chen, J.P. Johnson

Investigation of Bouyancy Driven Flow in a Simplified Full Scale Underhood – PIV and Temperature Measurements 53

K.H. Chen, J.P. Johnson, P. Merati, C.H. Leong

Investigation of Bouyancy Driven Flow in a Simplified Full-Scale Underhood – Numerical Study 75

Simon Watkins, Riccardo Pagliarella

The Flow Environment of Road Vehicles in Winds and Traffic 101

Separation Control for Drag Reduction

L. Taubert, I. Wygnanski

Preliminary Experiments Applying Active Flow Control to a 1/24th Scale Model of a Semi-Trailer Truck 105

<i>A. Seifert, O. Stalnov, D. Sperber, G. Arwatz, V. Palei, S. David, I. Dayan, I. Fono</i>	
Large Trucks Drag Reduction using Active Flow Control	115
<i>R. Spivey, R. Hewitt, H. Othman, T. Corke</i>	
Flow Separation Control on Trailing Edge Radii using Single Dielectric Barrier Discharge Plasma Actuators: An Application to Vehicle Drag Control	135
<i>L. Cattafesta, Y. Tian, R. Mittal</i>	
Adaptive Control of Post-Stall Separated Flow Application to Heavy Vehicles	151
<i>Jason Ortega, Kambiz Salari, Bruce Storms</i>	
Investigation of Tractor Base Bleeding for Heavy Vehicle Aerodynamic Drag Reduction	161
<i>C.N. Nayeri, J. Haff, D. Greenblatt, L. Loefdahl, C.O. Paschereit</i>	
Drag Reduction on a Generic Tractor-Trailer using Active Flow Control in Combination with Solid Flaps	179

Design Optimization Techniques Related to Vehicle Aerodynamics

<i>Ilhan Bayraktar</i>	
Advanced Aerodynamics and Cooling System Solutions for Higher Fuel Efficiency and Decreased Emissions	195
<i>Siniša Krajnović</i>	
Optimization of Aerodynamic Properties of High-Speed Trains with CFD and Response Surface Models	197
<i>Bhaskar Bhatnagar, Dan Schlesinger</i>	
Design Considerations for Maximizing Cooling Package Performance	213
<i>Clinton Lafferty, Kevin Horrigan, Ales Alajbegovic</i>	
Optimization and Correlation of a Class 8 Truck Cooling System	215

Train Aerodynamics

Alexander Orellano, Stefan Sperling

Aerodynamics Improvements and Associated Energy Demand Reduction of Trains	219
---	-----

Andreas Dillmann

The use of Aeronautical Experimental Facilities and Measurement Techniques for the Aerodynamic Investigation of High Speed Trains	233
--	-----

Sigfried Loose

Reduction of Skin-Friction Drag on a Generic Train Configuration	235
--	-----

Arnd Rueter

Head Pressure Effects of Trains and Locomotives – Engineering Calculation Approaches for Homologation Purpose	237
--	-----

Jing Zhao, Renxian Li

Numerical Analysis for Aerodynamics of High-Speed Trains Passing Tunnels	239
---	-----

Poster Session

Renxian Li, Jing Zhao, Shu Zhang

A Study of the Influence of Aerodynamic Forces on a Human Body near a High-Speed Train	243
---	-----

James C. Paul, Richard W. Johnson, Robert G. Yates

Application of CFD to Rail Car and Locomotive Aerodynamics	259
--	-----

Gandert M.R. Van Raemdonck, Michel J.L. van Tooren

Data Acquisition of a Tractor-Trailer Combination to Register Aerodynamic Performances	299
---	-----

Eddy Willemsen

Automotive Testing in the DNW-LLF Wind Tunnel	311
---	-----

Bruce Storms, Jason Ortega, Kambiz Salari

An Experimental Study of Tractor Base Bleed for Heavy Vehicle Aerodynamic Drag Reduction	317
---	-----

CFD, Numerical Methods and Application

Parviz Moin

Application of High Fidelity Numerical Simulations for Vehicle Aerodynamics	321
---	-----

Florian Menter

Scale-Adaptive Simulation in the Context of Unsteady Flow Simulations	323
---	-----

K. Sreenivas, B. Mitchell, S. Nichols, D. Hyams, D. Whitfield

Computational Simulation of the GCM Tractor-Trailer Configuration	325
---	-----

Ramesh Pankajakshan, Brent Mitchell, David L. Whitfield

Full-Scale Simulations of Drag Reduction Devices for Class 8 Trucks	339
---	-----

David Pointer, Tanju Sofu, Jimmy Chang, David Weber

Applicability of Commercial CFD Tools for Assessment of Heavy Vehicle Aerodynamic Characteristics	349
---	-----

Christopher J. Roy, Harshavardhan A. Ghuge

Detached Eddy Simulations of a Simplified Tractor/Trailer Geometry	363
--	-----

Kambiz Salari, Paul Castellucci

A Hybrid RANS/LES Turbulence Model for use in the Simulation of Turbulent Separated Flows	383
---	-----

Vehicle and Tire Spray and Vehicle Interaction

Simon Watkins

Spray from Commercial Vehicles: A Method of Evaluation and Results from Road Tests	387
--	-----

Charles Radovich, Dennis Plocher

Experiments on Spray from a Rolling Tire	403
--	-----

Florian Iser, Raimund A. Almbauer

Computational Simulation of the Flow Field of a Filter System inside Self-Ventilated Road Tunnels due to Heavy Vehicle Traffic	419
--	-----

B. Basara, S. Girimaji, S. Jakirlic, F. Aldudak, M. Schrefl

Experiments and Calculations Relevant to Aerodynamic Effects during Highway Passing Maneuvers	433
---	-----

Drag Reduction

Mark Page

Design & Test Techniques for Drag Reduction at Swift Engineering – A Racecar Manufactures Perspective	449
--	-----

Jason Leuschen, Kevin R. Cooper

Summary of Full-Scale Wind Tunnel Tests of Aerodynamic Drag-Reducing Devices for Tractor-Trailers	451
--	-----

Réjean Laflamme

A Fleet Operator's Perspective on Commercial Vehicle Drag Reduction	463
---	-----

Kenneth D. Visser, Kevin Grover

Class 8 Vehicle Fuel Savings using Sealed Single and Dual Open Aft Cavities	465
--	-----

Alec Wong, Kevin Horrigan

A Novel Approach to Heavy Vehicle Drag Reduction	467
--	-----

Linus Hjelm, Björn Bergqvist

European Truck Aerodynamics – A Comparison Between Conventional and CoE Truck Aerodynamics and a Look into Future Trends and Possibilities	469
--	-----

Mike Camosy, Andre Brown, Henri Kowalczyk, Gaylord Couthier

Advanced Experimental Methods for the Analysis and Aerodynamic Design of Heavy Vehicles	479
--	-----

Author Index	481
---------------------------	------------

The Aerodynamics of Heavy Vehicles II: Trucks, Buses,
and Trains

Browand, F.; McCallen, R.; Ross, J. (Eds.)

2009, XV, 483 p. With CD-ROM., Hardcover

ISBN: 978-3-540-85069-4