

Program

Aerodynamics of Heavy Vehicles III: Trucks, Buses and Trains

September 12-17, 2010

Seminaris Seehotel

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Program Chair:

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German Aerospace Center



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Sunday, 12 September 2010

17:00 – 18:30	Conference Check-in
18:30 – 20:00	Dinner Buffet
20:00 – 21:00	Welcome reception

NOTES

- Meals will be in the Restaurant “Templiners” (with exception of banquet – location to be determined).
- Audiotaping, videotaping and photography of presentations are prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Be sure to make any corrections to your name/contact information on the Master Participant List or confirm that the listing is correct. A corrected copy will be sent to all participants after the workshop.

Monday, 13 September 2010

- 07:30 – 08:30 Breakfast Buffet
- 08:30 – 08:45 Welcome and Conference Introduction
Andreas Dillmann, Conference Chair
Jules Routborth, ECI Technical Liaison
- 08:45 – 09:45 *Invited Paper:*
HIGH ENERGY EFFICIENT GROUND TRANSPORT SYSTEM 'AERO-TRAIN'
Yasuaki P. Kohama, NICHe, Tohoku University,
S. Kikuchi, Gifu University, K. Kosuge, Sugawara, Tohoku University, Y. Noguchi, Tokyo University of Science, M. Sakamoto, Miyazaki University, M. Kikuchi, National Institute of Advanced Industrial Technology, Japan
- 09:45 – 10:45 **Session 1: Train Aerodynamics**
- 09:45 – 10:15 **ANALYSIS OF FLOW STRUCTURES IN THE WAKE OF A HIGH-SPEED TRAIN**
Tomas W. Muld, KTH Aeronautical and Vehicle Engineering, Sweden
- 10:15 – 10:45 **AERODYNAMIC DRAG REDUCTION OF OPEN-TOP GONDOLA AND HOPPER CARS IN UNIT TRAIN OPERATION AND IMPACT ON TRAIN FUEL CONSUMPTION AND ECONOMICS**
James C. Paul, P.E., Airflow Sciences Corporation, USA
- 10:45 – 11:15 Coffee Break
- 11:15 – 12:45 **Session 2: Train Aerodynamics – Underbody Flow**
- 11:15 – 11:45 **EXPERIMENTAL INVESTIGATION OF THE FLOW FIELD UNDERNEATH A GENERIC HIGH-SPEED TRAIN AND THE EFFECTS OF GROUND AND TRAIN ROUGHNESS**
Mattias Jönsson, Sigfried Loose, German Aerospace Center (DLR), Germany
- 11:45 – 12:15 **STUDY OF THE BOGIE FAIRING INFLUENCE ON THE UNDERBODY FLOW FOR HIGH SPEED TRAINS**
Javier Garcia, Antonio Crespo, Jorge Muñoz, Universidad Politecnica de Madrid, Aitor Berasarte, CAF, Spain
- 12:15 – 12:30 Discussion
- 12:30 – 14:15 Lunch
- 14:15 – 15:15 **Session 3: Truck Aerodynamics – Drag Reduction**
- 14:15 – 14:45 **DRAG REDUCTION OF TRUCKS BY USING CAB ROOF DEFLECTORS**
Hayri Acar, Ýstanbul Technical University, Turkey
- 14:45 – 15:15 **PASSIVE DEVICES FOR REDUCING BASE PRESSURE DRAG IN CLASS 8 TRUCKS**
Ramesh Pankajakshan, C. Bruce Hilbert, David L. Whitfield, SimCenter:National Center for Computational Engineering, USA
- 15:15 – 15:45 **THE STUDY OF TRUCK AERODYNAMIC DRAG REDUCTION USING REAR END CORNER NOZZLES**
Shih H. Chen, Hsi-Tsong Chen, Pei-Tat long, National Cheng Kung University, Taiwan

Monday, 13 September 2010 (continued)

15:45 – 16:00 Discussion

16:00 – 18:30 Free time

18:30 – 20:00 Dinner

20:00 – 21:00 Social Hour

Tuesday, 14 September 2010

- 07:30 – 08:30 Breakfast Buffet
- 08:30 – 09:30 *Invited Paper:*
AERODYNAMICS OF COMMERCIAL VEHICLES
Thorsten Frank, Daimler AG, Germany
- 09:30 – 10:30 **Session 4: Truck Aerodynamics**
- 09:30 – 10:00 **ASPECTS OF CFD APPLICATIONS TO HEAVY VEHICLE AERODYNAMIC DESIGN**
David Gosman, Fred Ross, CD-adapco, UK
- 10:00 – 10:30 **EXPERIMENTAL AND FULL SCALE INVESTIGATION OF BASE CAVITY DRAG REDUCTION DEVICES FOR USE ON GROUND TRANSPORT VEHICLES**
Joshua P. Kehs, K. D. Visser, Clarkson University, J. Grossman, C. Horell, A. Smith, ATDynamics, USA
- 10:30 – 11:00 Coffee Break
- 11:00 – 12:30 **Session 5: Train Aerodynamics – Cross Wind Effects**
- 11:00 – 11:30 **OPTIMISATION OF A HIGH SPEED TRAIN WITH RESPECT TO CROSS WIND PERFORMANCE**
Martin Schober, Andreas Tietze, Alexander Orellano, Bombardier, Germany
- 11:30 – 12:00 **NUMERICAL INVESTIGATION ON THE EMBANKMENT CONFIGURATION FOR CROSS WIND STABILITY OF ICE3**
Irfan Ali, Arnd Rüter, Siemens AG, Carlos-Jose Rodriguez Ahlert, RWTH Aachen, Germany
- 12:00 – 12:30 **HI-SPEED TRAIN CROSSWIND ANALYSIS: CFD STUDY AND VALIDATION WITH WIND-TUNNEL TESTS**
Paolo Schito, Carlo Catanzaro, Federico Cheli, Daniele Rocchi, Gisella Tomasini, Politecnico di Milano, Italy
- 12:30 – 14:00 Lunch
- 14:00 – 15:00 **Session 6: Truck Aerodynamics – Drag Reduction**
- 14:00 – 14:30 **FULL-SCALE WIND TUNNEL EVALUATION OF TRUCK AERODYNAMIC DRAG REDUCTION ADD-ON DEVICES**
Kambiz Salari, Lawrence Livermore National Laboratory, USA
- 14:30 – 15:00 **NUMERICAL AND WIND TUNNEL ANALYSIS TOGETHER WITH ROAD TEST OF AERODYNAMIC ADD-ONS FOR TRAILERS**
Gandert Van Raemdonck, Michel Van Tooren, TU Delft , Netherlands
- 15:00 – 18:30 *Ad hoc* discussions / free time
- 18:30 – 19:30 Dinner
- 19:30 – 20:30 **Session 7: Truck Aerodynamics – Experimental Techniques**
- 19:30 – 20:00 **IN DEPTH CD/FUEL ECONOMY STUDY CORRELATING SAE TYPE II RESULTS WITH SCALE MODEL ROLLING ROAD AND NON-ROLLING ROAD WIND TUNNEL RESULTS**
Mike Camosy, Fritz Marinko, Henri Kowalczyk, Auto Research Center LLC, USA

Tuesday, 14 September 2010 (continued)

20:00 – 20:30 **TOWING TANK EXPERIMENTS FOR BLUFF BODY AERODYNAMICS**
Christian Navid Nayeri, Jan Glas, Jakob Violet, Christian Oliver Paschereit,
TU-Berlin, Germany

20:30 – 21:30 Social Hour

Wednesday, 15 September 2010

- 07:30 – 08:30 Breakfast Buffet
- 08:30 – 09:30 *Invited Paper:*
CLOSED-LOOP ACTIVE FLOW CONTROL TO REDUCE DRAG AND CROSS WIND EFFECTS
Rudibert King, TU Berlin, Germany
- 09:30 – 10:30 **Session 8: Truck Aerodynamics – Active Flow Control**
- 09:30 – 10:00 **INVESTIGATION ON THE INFLUENCE OF PERIODICALLY-BLOWING ACTUATORS ON THE WAKE AND THE TOTAL DRAG OF GENERIC 3D CAR MODELS**
Daniel Krentel, Rifet Muminovic, Wolfgang Nitsche, Rudibert King, TU Berlin, Germany
- 10:00 – 10:30 **NUMERICAL INVESTIGATION OF ACTIVE SEPARATION CONTROL ON A GENERIC TRUCK**
Sandor Eichinger, Frank Thiele, Erik Wassen, TU Berlin, Germany
- 10:30 – 11:00 Coffee Break
- 11:00 – 12:30 **Session 8: Truck Aerodynamics – Active Flow Control (continued)**
- 11:00 – 11:30 **COMPUTATIONS AND FULL-SCALE TESTS OF ACTIVE FLOW CONTROL APPLIED ON A VOLVO TRUCK-TRAILER**
Mohammad El-Alti, Valery Chernoray, Per Kjellgren, Chalmers University of Technology, Linus Hjelm, Volvo 3P, Lars Davidson, Chalmers University of Technology, Sweden
- 11:30 – 12:00 **COUPLING ACTIVE AND PASSIVE CONTROL TECHNIQUES FOR DRAG REDUCTION AROUND A SQUARE BACK AHMED BODY**
Iraj Mortazavi, Charles-Henri Bruneau, Delphine Depeyras, Universite de Bordeaux, Emmanuel Creuse, Universite Lille 1, Patrick Gillieron, Renault SA, France
- 12 :00 – 12:30 **HEAVY TRUCKS FUEL SAVINGS USING THE SAOB ACTUATOR**
Avraham Seifert, Tel Aviv University, Isaac Dayan, TAU, Israel, Chuck Horrell, Jeff Grossmann and Andrew Smith, ATDynamics, Inc., USA
- 12 :30 – 14:00 Lunch
- 14 :00 – 15:00 **Session 9: Train Aerodynamics – Experimental Techniques**
- 14:00 – 14:30 **INVESTIGATIONS OF AEROACOUSTICS OF HIGH SPEED TRAINS IN WIND TUNNELS BY MEANS OF THE PHASED MICROPHONE ARRAY TECHNIQUE**
Andreas Lauterbach, Stefan Kröber, Klaus Ehrenfried, Sigfried Loose, German Aerospace Center (DLR), Germany
- 14:30 – 15:00 **THE INFLUENCE OF WIND TUNNEL TURBULENCE ON AERODYNAMIC COEFFICIENTS OF TRAINS**
Christian Navid Nayeri, Christoph Strangfeld, TU-Berlin, Martin Schober, Andreas Tietze, Bombardier Transportation GmbH, Christian Oliver Paschereit, TU-Berlin, Germany
- 15:00 – 18:30 Ad hoc discussions / free time
- 15:30 – 17:30 Boat Cruise (optional)

Wednesday, 15 September 2010 (continued)

18:30 – 20:00 Conference Dinner

20:00 – 21:00 **Session 10: Heavy Vehicles – Computational Fluid Dynamics**

20:00 – 20:30 **WHAT CAN LES DO FOR AERODYNAMICS OF HEAVY VEHICLES?** Sinisa Krajnovic, Chalmers University of Technology, Sweden

20:30 – 21:00 **EFFECT OF TRANSIENT AERODYNAMICS ON UNCERTAINTY IN DRAG PREDICTIONS USING AERODYNAMICS SIMULATIONS FOR A HEAVY TRUCK IN YAW FLOW**
Per Elofsson, Guillaume Mercier, Scania CV AB, Sweden, Brad Duncan, Exa Corporation, Boston, USA, Samuel Boissinot, Exa GmbH, Munich, Germany

Thursday, 16 September 2010

- 07:30 – 08:30 Breakfast Buffet
- 08:30 – 09:30 *Invited Paper:*
AERODYNAMIC REQUIREMENTS ON PASSENGER RAILWAY ROLLING STOCK BY DEUTSCHE BAHN AG
Thorsten Tielkes, Deutsche Bahn AG, Germany
- 09:30 – 10:30 **Session 11: Trains**
- 09:30 – 10:00 **FULL-SCALE AERODYNAMIC MEASUREMENTS FOR HIGH-SPEED TRAINS : A VIEW ON SOME PRESENT ISSUES AND FUTURE PERSPECTIVES**
Rémi Gregoire, ALSTOM Transport, France, Sigfried Loose, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Bernd Hagenah, Gruner GmbH, Germany
- 10:00 – 10:30 **SUSTAINABLE DESIGN OF UNDERGROUND RAIL SYSTEMS – AERODYNAMICS AT THE INTERFACE OF ROLLING STOCK AND CIVIL CONSTRUCTION**
Peter Reinke, Andreas Busslinger, Samuel Nyfeler, HBI Haerter Ltd., Switzerland
- 10:30 – 11:00 Coffee Break
- 11:00 – 12:30 **Session 12: Trains in Tunnel – Aerodynamics and Aeroacoustics**
- 11:00 – 11:30 **A STUDY OF AERODYNAMIC EFFECTS OF HIGH-SPEED TRAINS THROUGH TUNNELS**
Jing Zhao, Renxian Li, Jianliang Li, Southwest University, P.R.China
- 11:30 – 12:00 **A SIMPLIFIED MODEL OF THE WAVE GENERATION DUE TO TRAIN-TUNNEL ENTRY**
Sebastian Wagner, Klaus Ehrenfried, Andreas Dillmann, German Aerospace Center (DLR), Germany
- 12:00 – 12:30 **PRESSURE CHAMBER TESTS TO DETERMINE PASSENGER PRESSURE COMFORT ON FUTURE GERMAN HIGH-SPEED-LINES WITH SINGLE-TRACK-TUNNELS**
Peter Claus, Martin Eisenlauer, Thorsten Tielkes, Deutsche Bahn AG, Germany
- 12:30 – 14:00 Lunch
- 14:00 – 15:00 **Session 13: Truck Aerodynamics – Special Effects**
- 14:00 – 14:30 **WHEEL HOUSING AERODYNAMICS ON HEAVY TRUCKS**
David Söderblom, Chalmers University of Technology, Per Elofsson, Scania CV, Linus Hjelm, Volvo 3P, Lennart Löfdahl, Chalmers University of Technology, Sweden
- 14:30 – 15:00 **COMBINED UNDERHOOD THERMAL AND EXTERNAL AERODYNAMIC ANALYSES**
Tanju Sofu, L. K. Hwang, Cummins Inc., Argonne National Laboratory, USA.
- 15:00 – 18:30 *Ad hoc* discussions / free time

Thursday, 16 September 2010 (continued)

18:30 – 19:30 Dinner

19:30 – 20:30 **Session 14: Train Aerodynamics – Experimental Techniques**

19:30 – 20:00 **WIND-TUNNEL INVESTIGATIONS OF THE TGV-DUPLEX HIGH-SPEED TRAIN'S POWER-CAR IN A CROSS-WIND SITUATION WHILE RUNNING OVER A FLAT GROUND FITTED WITH A SINGLE TRACK WITH BALLAST AND RAILS**

Rémi Gregoire, Marc Stiepel, ALSTOM Transport, Nicolas Paradot, Société Nationale des Chemins de fer Français (SNCF), Jean-Paul Bouchet, Centre Scientifique et Technique du Bâtiment (CSTB), France
Siegfried Loose, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Germany

20:00 – 20:30 **EVALUATION OF THE WIND-TRAIN SPEED THROUGH PRESSURE MEASUREMENTS ON TRAIN SURFACE**

Gisella Tomasini, Federico Cheli, Daniele Rocchi, Livio Mariano, Politecnico di Milano, Italy

20:30 – 21:30 Social Hour

Friday, 17 September 2010

- 07:30 – 08:30 Breakfast Buffet
- 08:30 – 09:30 ***Invited Paper:***
REYNOLDS NUMBER EFFECTS IN FLOW AROUND BLUFF BODIES
Günter Schewe, DLR, Germany
- 09:30 – 11:30 **Session 15: Bluff Body, Wake and Jet Flows**
- 09:30 – 10:00 **COMPARISON OF EXPERIMENTALLY AND NUMERICALLY OBTAINED FLOW PROPERTIES OF A BLUFF BODY**
Gandert Van Raemdonck, Michel Van Tooren, TU Delft, Netherlands
- 10:00 – 10:30 **QUANTITATIVE FLOW VISUALIZATION APPLIED TO A PASSIVE WAKE CONTROL PROBLEM**
Andrin Landolt, David Borer, Alexander Meier, Thomas Roesgen, ETH Zurich, Switzerland
- 10:30 - 11:00 Coffee Break
- 11:00 – 11:30 **EXPERIMENTAL AND NUMERICAL INVESTIGATION OF CABIN FLOW IN A MINI-VAN**
André Heider, Mikhail Konstantinov, Claus Wagner, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Germany
- 11:30 – 13:00 **Session 16: Truck Aerodynamics – Computations**
- 11:30 – 12:00 **LES STUDY OF A SIMPLIFIED TRACTOR-TRAILER MODEL**
Jan Östh, Sinisa Krajnovic, Chalmers University of Technology, Sweden
- 12:00 – 12:30 **A NUMERICAL INVESTIGATION ON AERODYNAMIC OPTIMIZATION ON A MODEL TRUCK**
Antoine Devesa, Andreas Dietz, Thomas Indinger, FluiDyna GmbH / TU München, Germany
- 12:30 – 13:00 **AERODYNAMICS OF A CRYOGENIC SEMI-TANKER**
Jason Ortega, Kambiz Salari, Lawrence Livermore National Laboratory, USA
- 13:00 – 13:15 Closing Remarks
- 13:15 Lunch and Departure