First International Conference in Numerical and Experimental Aerodynamics of Road Vehicles and Trains (Aerovehicles 1)

23-25 June 2014, Bordeaux, France

Program

Monday 23 June

08h30-08h50 **Welcome coffee/tea and registration**

08h50-09h00 **Conference opening**

09h00-09h40 **Invited talk: Olivier Cadot**
From full to laboratory scale flows with real and simplified car models

09h40-10h40 **Plenary session: Road vehicle aerodynamics**

B. Basara, S. Krajnovic & Z. Pavlovic
Computations of unsteady flow around a car model using the Partial-Averaged Navier-Stokes method

O.A. Mankowski, D.B. Sims-Williams A. Hunt & R.G. Dominy
An Active Turbulence Generation System for the Simulation of Aerodynamic Transients in a Model Wind Tunnel

A. Lock, T. Johansen, E. de Villiers & P. Geremia
Validation of an automated process for DES of external vehicle aerodynamics

10h40-11h00 **Coffee/tea break**

11h00-13h00 **Plenary session: Road vehicle aerodynmics**

M. Mirzaei & S. Krajnovic
Numerical simulation of two vehicles at short distances in a platoon

D. E. Aljure, O. Lehmkuhl, D. Martinez, F. Favre & A. Oliva
On the IMB approximation for the wheel aerodynamic simulation

J. Haff, M. Jönsson, S. Huntgeburth, T. Gries, S. Loose & C. Wagner
Particle Image Velocimetry in the Near Wake of a real Tractor-Trailer Configuration in a Road Test

S. Srinath, C. Sicot, L.E. Brizzi & B. Gardarin
Experimental investigation of the flow around a rotating wheel in road realistic conditions. Unsteady pressure-velocity analysis

P. Lichtneger & B. Ruck
Transient wind loads on roadside-mounted and overhanging flat elements induced by passing vehicles

M. Henner, Y. Beddadi, F. Fernand, J. Blandin & K. Azzouz
Effect of engine cooling on vehicle drag and consumption

13h00-14h20 **Lunch**

14h20-16h00 **Plenary session: Flow control & optimization for road vehicles**

H. Choi, H. Lee & D. Kim
Automatic moving deflector for drag reduction of a three-dimensional model vehicle

C. N. Nayeri, R. Woszidlo, T. Stumper, H.-J. Schmidt & C.O. Paschereit
Drag reduction on a generic Tractor-Trailor using sweeping jets in combination with flaps

S. Chaligné, T. Castelain, M. Michard, D. Chacaton & D. Juvé
Experimental application of active flow control on a 1:8 scale, simplified truck model

R. G. Stephens, A. W. J. Ford & H. Babinsky
Extended Abstract: Practical Boat-tails for Road Trucks

D. Parkin, J. Sheridan & M. C. Thompson
Numerical analysis of periodic open-loop flow control on bluff bodies in ground proximity

16h00-16h20 **Coffee/tea break**

16h20-18h00 **Parallel Session: Road vehicle aerodynamics**

K. Selvakumar & K.M. Parammasivan
Computational and Experimental Invetigations on Aerodynamic Characteristics on a Square Back Car Model with Rear Spoiler

C. D. Meneses, O. Lopez & L. Munoz
Comparison of Four Turbulence Models in the Study of a Station Wagon Aerodynamics

Q. Gallas, H. Machrouki, B. Gaston & D. Ricot
Aeroacoustic and Aerodynamic Validation of LaBS, a new CFD Solver Based on the Lattice Boltzmann Method

R. B. Kotapati, R. Shock & H. Chen
Effect of Modeling Laminar Flows on the Drag Predictions of the Ahmed Body

L. Tsioraklidis & F. Konias
Streamlining Aerodynamic CFD Analyses

16h20-18h20 **Parallel Session: Train aerodynamics & optimization**

S. Sperling, B. Schulz, P. Gölz & A. Orellano
Aerodynamic optimization for VHST

D. Soper, C. Baker & M. Sterling
Assessing crosswind effects on a container freight train with differing container loading configurations

X. Shi & Y. Zheng
Numerical Simulation of the Flow around a High Speed Train Subject to Unsteady Side Winds

A.D. Quinn, C.J. Baker & M. Gallagher
The measurement of aerodynamic phenomena in operational conditions on rail vehicles

R.G. Dominy & C. Edgar
Ekranotrains: The Aerodynamic Characteristics of Wing in Ground Effect (WIG) Craft for Ultra High Speed Trains

F. Deliancourt, C. Sicot, J. Borée, S. Aguinaga & J-P. Bouchet
The effect of roof-mounted cables on the aerodynamics of railway trains : an experimental study

18h30-20h30 **Welcome cocktail & diner**

Tuesday 24 June

09h00-09h40 **Invited talk: Carsten Othmer**
Adjoint Methods for Car Aerodynamics

09h40-11h00 **Plenary session: Road vehicle aerodynamics**

E. Guilmineau
Numerical simulation around a realistic generic car model with different rear profiles

R. Volpe, P. Devinant & A. Kourta
Experimental Characterization of the Mean and Fluctuating Fields of the Natural Wake of a Fullscale Squareback Ahmed Body

S. Watkins & M. Thompson
Predictions of Interior Wind Noises From External Pressures: Model and Full-Scale Tests

D. Barros, J. Osth, J. Borée, S. Krajnovic, B.R. Noack & T. Ruiz
Flow around a three-dimensional blunt body: topology, dynamics and drag

11h00-11h20 **Coffee/tea break**

11h20-12h40 **Plenary session: Train aerodynamics & optimization**

J.R. Bell, D. Burton, M. C. Thompson, A. Herbst & J. Sheridan
The Unsteady Wake of High-Speed Trains

N. Paradot, E. Allain, X. De La Casa, J. Pauline, Ph. Delpech & J.-P. Bouchet
A Numerical Modelling of the Snow Accumulation on a High-Speed Train

C. Somaschini, M. Livraghi, M. Merli, A. Premoli, D. Rocchi, P. Schito & G. Tomasini
Ballast flight under high-speed trains: full-scale experimental tests

M.H. Kwak, S.I. Lee, S.H. Yun, H.B. Kwon, D.H. Lee & K.H. Kim
Three-dimensional nose shape optimization of the front-rear symmetric train wit different design objectives

12h40-14h00 **Lunch**

14h00-15h20 **Plenary session: Train aerodynamics & optimization**

Y. Nakamura, T. Moroto, N. Okura & M. Suzuki
Study of Aerodynamic Forces Acting on a Train Using a Tornado Simulator

H. Hemida
Effect of the shape of the edge of a splitter plate on train aerodynamic forces in a wind tunnel test: A numerical investigation

D. Soper, C. Baker, M. Sterling & A.D. Quinn
A comparison of model and full scale experimental data to assess the suitability of analysing slipstream development of container freight trains using the train rig facility

J. García, J. Munoz-Paniagua, A. Jiménez, E. Migoya & A. Crespo
Numerical calculation of the unsteady loads on trains under winds of different turbulence characteristics

15h20-15h40 **Coffee/tea break**

15h40-17h20 **Parallel Session: Flow control & optimization for road vehicles**

J. McNally, F. S. Alvi, N. Mazellier & A. Kourta
Experiments on Active Flow Control Devices for Wake Modification on a Simplified Ground Vehicle Model

D. Norrby, M. Chevalier & S. Wallin
Drag reduction for platooning trucks; a CFD study using detached eddy simulation

G. Rossitto, J. Borée, C.Sicot, V.Ferrand & F.Harambat
Influence of the afterbody rounding on the pressure forces of the Ahmed body

J. Ost & G.P. Romano
Experimental investigations on the effects of horizontal and vertical deflectors on the performances of a square back car

C. Pivot, T. Duriez, C. Douay, L. Pastur, F. Lusseyran & C. Letellier
Toward time-delayed feedback control in an open cavity flow

15h40-17h20 **Parallel Session: Aerodynamics, heat transfer & equipment dynamics**

M. Elmore, F. J. Ross & R. Averill
Simultaneously Optimizing Cooling Performance while Reducing Aerodynamic Drag

J. E. Lombard & S. Sherwin
Towards the application of spectral/hp element methods to the industrial design cycle of an aerovehicle

L. Phersson, J. Sheridan, M. Thompson & D. Burton
Effect of sinusoidal forcing on bluff-body drag

J. Prince, J. Peiro & M. Tabarra
Design of a Multi-Dimensional Dynamic Fluid Network Simulator

L. S. Roberts, J. Correia, M. V. Finnis & K. Knowles
Aerodynamic Characteristics of a Monoposto Racing Car Front Wing in Yaw

20h00-23h00 **Conference banquet**

Wednesday 25 June

09h00-09h40 **Invited talk : Avi Seifert**
From Lab to Full Scale Drag Reduction: How to Bridge the Gap

09h40-10h40 **Plenary session: Train aerodynamics & optimization**

S.Aguinaga
Experimental and numerical investigation of the wake of the TGV Duplex in crosswind condition: effect of the ground scenario

S. Jeong, S. Lee, K. Kim
Study of High Speed Train Pantograph Arm for Aerodynamic Drag and Noise Reduction using Numerical Simulation

J. Östh, Eurika Kaiser, Siniša Krajnovic & Bernd R. Noack
The dynamics of the flow in the wake of a generic high-speed train studied by Large Eddy Simulation and Cluster-based Reduced-Order Modelling

10h40-11h00 **Coffee/tea break**

11h00-13h00 **Plenary session: Flow control & optimization for road vehicles**

L. Salati, P. Schito, F. Cheli & C. Somaschini
Heavy truck drag reduction devices installed on the trailer: front and rear appendages

E. Fernandez, K. Taira & Y. Yamaguchi
Drag Reduction on Flat-Back Ground Vehicle with Active Flow Control: Part I. Simulation

J. Vernet, R. Orlü, P. H. Alfredsson_& P. Elofsson
Flow separation delay on trucks A-pillars by means of Dielectric Barrier Discharge actuation

Y. Eulalie, P. Gilotte & I.Mortazavi
LES computations around an Ahmed bluff body: flow description and control solutions for drag reduction

N. Peres & R. Pasquetti
Numerical investigations on wake control using synthetic microjets

M. Metka, J. W. Gregory, A. Sassoon & J. McKillen
Drag Reduction on the Squareback Ahmed Model Using Fluidic Oscillators

13h00-14h20 **Lunch**

14h20-16h20 **Plenary session : Flow control & optimization for road vehicles**

J. Pfeiffer & R. King
Closed-loop active flow control for road vehicles under transient cross-wind conditions

C. H. Bruneau, P. Gilliéron, K. Khadra & Iraj Mortazavi
Flow control for simplified road vehicles

J. McNally, G. Robertson, R. Kumar, F. Alvi, K. Murayama & Y. Yamaguchi
Drag Reduction on Flat-Back Ground Vehicle with Active Flow Control: Part II. Experiment

J. Munoz-Paniagua, J. García, A. Crespo & O. González
Multi-objective aerodynamic optimization of a simplified tractor-trailer model

D. Barros, T. Ruiz, J. Borée & B. R. Noack
Control of a three-dimensional blunt body wake using pulsed jets

H. Telib, R. Arpa, A. Scardigli, E. Dini & A. Torlucci
A framework for aerodynamic shape optimization using free-form deformation and domain decomposition

16h20-16h40 **Coffee/tea break**

16h40-17h20 **Parallel Session: Road vehicle aerodynamics**

A. Lahaye, A. Leroy & A. Kourta
A Square Back Ahmed Model Wake Flow Analysis in View of Aerodynamic Drag Reduction

Lalit Patidar & Sri Ramya Bhamidipati
Shape optimization and drag reduction of a Formula SAE/Formula Student electric race car using numerical and experimental studies

16h40-17h20 **Parallel Session: Aerodynamics, heat transfer & equipment dynamics**

S. Yilmaz, K. Erdogan, A. T. Ergenc, U. Cirik, A. Altiner, M. K. Sevindir & A. Yurtseven
The Underhood Thermal Management and Cooling Drag Effects of an Active Grille Shutter Prototype for Light Duty Vehicle under Simulated and Real Test Environments

D. C. Forbes
Simulating the 2DOF dynamic motion of a road vehicle on its suspension system as a result of aerodynamic inputs

17h20-18h00 **Conference closure & reception**

The length of time for all plenary and parallel session presentations is 15 minutes + 5 minutes for questions and comments (in **total 20 minutes** for each talk).