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## Introduction

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**Biographical notes:** Jean-Denis Parisse's first academic position was in Evry from 2003 to 2008 as an Associate Professor. From 2008 to 2015, he has a position in Aix-Marseille-University. Since 2015, he has a position at French Air Force Academy in Salon de Provence. His research fields are high enthalpy flows and cold plasmas modelling and numerical simulations. His works range from laser-matter interaction to plasma flow control. He is also a member of the Aerodynamic Committee of the 3AF Society.

Bruno Chanetz is a Research Engineer at Onera in 1983, the Head of Hypersonic Group in 1990, the Head of Hypersonic Hyperenthalpic Project in 1997, the Head of Experimental Simulation and Physics of Fluid Unit in 1998 and the Deputy Director of the Fundamental and Experimental Aerodynamics Department in 2003. Since 2000, he has been a Master of Research, Level 2 at Onera. Since 2009, he has been an Associate Professor at the University Paris-Ouest. He is also a member of the Aerodynamic Committee of the 3AF Society.

Jean Délerly has been the Director of the DAFE at Onera until 2003. He is currently an Emeritus Advisor for this department, Chairman of the Aerodynamics Commission of the 3AF (French Aeronautics and Astronautics Society), and Chairman of the Scientific Committee of the National Centre for Technological Research in the field of aerodynamics and aeroacoustics of land vehicles.

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The International Conference on Applied Aerodynamics is organised each year by the French Aeronautics and Space Society (3AF) in a different venue in France known for its activities in the domain of aeronautics and/or space. The symposium is an excellent opportunity for scientific exchanges among the aerospace community where aerodynamicists from industry, research institutions and

academics meet. Scientists and engineers from other domains involving fluid mechanics are also welcome. The symposium concentrates each year on a different topic representative of the present concerns in the field of aerodynamics.

In 2014, the symposium was hosted by the Ecole Centrale de Lille, from March 24 to March 26. The 49th

3AF International Conference on Applied Aerodynamics (AERO2014) has focused on specific problems resulting from interaction between aerodynamics and environment. This involves both the effects of environment on aerodynamics performance and the impact of aerodynamics on the environment. Concerning the influence of aerodynamics on environment, problems of interest include topics related to nuisance, sustainable development of vehicles as well as fluidic devices for the environment management in buildings.

Among the many aspects of the problem, the following items were considered:

- atmospheric turbulence and instabilities (vortices, wakes, gusts, lateral wind)
- icing, super large droplets, ice crystals
- contamination, particle ingestion and erosion
- ground effects
- pollutant emission and dispersion
- aerodynamics for green vehicles, sustainable aerodynamics
- noise pollution, acoustic effects of new technologies
- HVAC: heating, ventilation and air conditioning.

The meeting was attended by 73 participants coming from 14 different countries (Algeria, Belgium, Canada, China, France, Germany, India, Japan, Russia, Serbia, Spain, United Arab Emirates, the UK, the USA) 39 communications having been presented (the five keynote conferences being included). The present special issue of the *International Journal of Engineering Systems Modelling and Simulation* is a selection of seven articles among the best communications presented during this symposium.