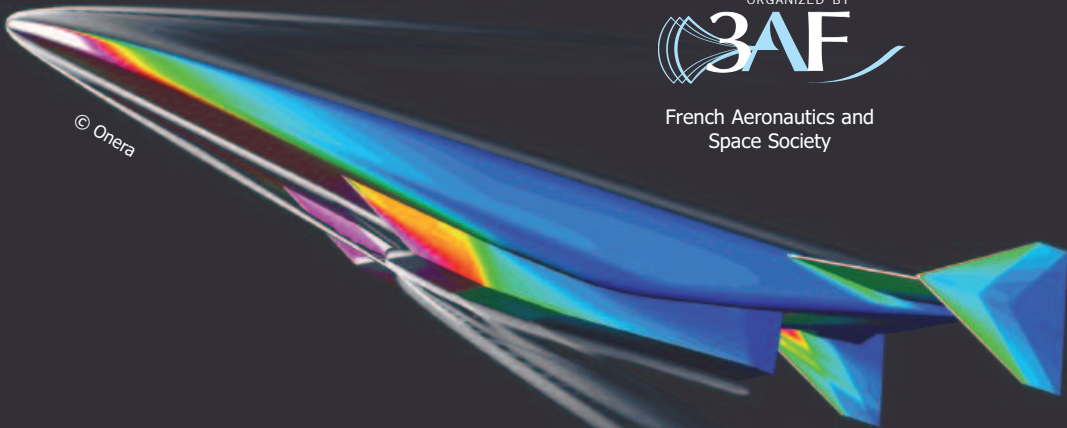


CALL FOR PAPERS

45Th Symposium of Applied Aerodynamics

Aerodynamics of high speed flows, from transonic to hypersonic

Marseille, March 22-23-24, 2010



French Aeronautics and
Space Society

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Aerodynamics of high speed flows, from transonic to hypersonic

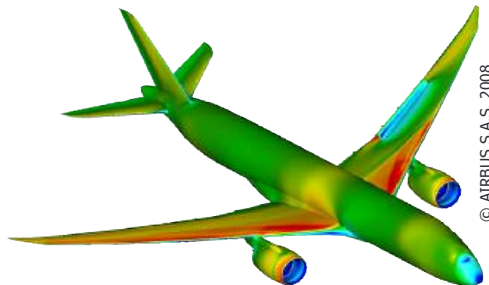
3AF, Association Aéronautique & Astronautique de France, organises every year in a different venue the Applied Aerodynamics Symposium known for its activities in the domain of aeronautics and/or space.

This 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 Applied Aerodynamics Symposium concentrates each year on a different topic representative of the present concerns in the field of aerodynamics. It is organised on the basis of five sessions, each introduced by a keynote speaker in the field covered by the session. The symposium ends with a technical visit in connection with the symposium's subject.

Although foreign colleagues have contributed to the symposium in the past, the Applied Aerodynamics Symposium has decided to open more largely its audience by extending the participation to the international community and adopting English as the working language.

This year, the symposium will focus on high speed aerodynamics which is characterised by compressibility effects giving rise to specific phenomenon, as shock waves, and influencing many aspects of the flow field as transition, turbulence, heat transfer, etc. The symposium will deal both with external and internal aerodynamics. The experimental, theoretical, numerical aspects, from fundamental research to industrial applications will be addressed. This symposium will consider problems met in the aerospace domain (both military and civilian) and in other domains such as energy production, transportation, etc.



Main topics

Among the many aspects of high speed aerodynamics, the following items will be considered (the list being not exhaustive):

- **Shock wave/boundary layer interactions** are the key phenomenon in high speed aerodynamics, since they are associated with increased drag, flow separation, unsteadiness and intense local heat transfer in hypersonic flows.
- **Shock/shock interferences** give rise to complex flow patterns, containing shock structures, concentrated expansion waves and intense slip lines, which can be at the origin of detrimental effects, especially at high Mach number.
- **Buffeting** and air intake buzz are characterised by the occurrence of large and spectacular fluctuations involving the whole flow field.
- **Unsteadiness** affecting nearly all interacting flows and which can lead to detrimental coupling between the flow and the vehicle structure.
- **Laminarity** which is considered as a promising and efficient way to diminish the drag of transonic or supersonic transport aircraft, but which can also be considered for hypersonic vehicles.
- **Hypersonic aerodynamics** is confronted with specific problems such as non equilibrium effects, extremely intense shocks and high heat transfer rates.
- **Supersonic business jet** projects have to deal with environmental aspects: low noise levels during take off and landing, low sonic boom during supersonic cruise, reduced fuel consumption (low drag) and high and low altitude emissions. The use of multi disciplinary optimisation may help to reach such a goal.
- **Predictive methods** have to cope with specific difficulties such as the capture of strong discontinuities (shock waves, concentrated expansions, slip lines), transition prediction, compressibility effects on turbulence, unsteadiness, shock separated flows, etc.
- **Experimental means** for high speed flows simulation and characterisation.

Keynote speakers

Daniel ARNAL

ONERA

Piotr DOERFFER

Polish Academy of Sciences

Thomas GATSKI

LEA/Old Dominion University

Sébastien VIGNERON

Dassault Aviation

Murray CROSS

Airbus UK

Call for papers

Communication abstracts (300 to 500 words with selected figures) have to be mailed to the 3AF Executive Secretary **before November 16, 2009**.

The Scientific Committee will inform the authors of acceptance by **mid-December 2009** at the latest.

Official language

Papers must be submitted and presented in English. Full papers (in English) must be sent to the 3AF Executive Secretary (secr.exec@aaaf.asso.fr) **before February 22, 2010** to allow their insertion in the symposium proceedings.

A selection of papers will be published in a special issue of the International Journal of Engineering Systems Modelling dedicated to the Applied Aerodynamics Symposium. Authors are however free to publish their paper in another journal with a reference to the Symposium being then appreciated.

Symposium deadlines

Abstract submission:	November 16, 2009
Paper acceptance:	December 14, 2009
Written paper:	February 22, 2010
Symposium in Marseille:	March 22-23-24, 2010

Symposium secretariat

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