International Workshop on Simulation, Experiments and Optimisation for the Design of a Future Aviation

Workshop Scope

Various technologies of computational and experimental approach are required to realise the ambitious goal of future quiet and fuel-efficient aircraft development. The aim of this workshop is to discuss various cutting edge techniques developed for the design of a future aviation through invited lectures. The maturity and limitation of the techniques will be discussed to facilitate the technology development for the future aviation design among the participants from universities, research institutes and industries. In this workshop, the following techniques for the design of a future aviation will be discussed: design optimisation techniques, computational analysis tools (CFD, CAA, etc.), and experimental techniques.

Date

February 22, 2012 (9:00-18:00)

Workshop Venue

ONERA-Châtillon - Salle Contensou (France)
http://www.onera.fr/chatillon-en/index.php

Organisers

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Registration

The workshop is free of charge but a registration is mandatory, by email to Daisuke Sasaki (sasaki@ad.mech.tohoku.ac.jp) and Gérald Carrier (carrier@onera.fr). The presentation will be delivered as post-proceeding to the speakers.

Organised and Sponsored by ONERA and Tohoku University of Global COE Program "World Center of Education and Research for Trans-disciplinary Flow Dynamics"

ONERA
THE FRENCH AEROSPACE LAB

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Institute of Fluid Science
TOHOKU
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Agenda

9:00- 9:10 Welcome to the Workshop

Session I:

9:10-9:40 “Uncertainty Quantification of Atmospheric Effects in Sonic Boom Analysis” Dr. Koji Shimoyama (Institute of Fluid Science, Tohoku University)

9:40-10:10 “Physical and Computational Experiments in MDO: from Vehicle Design to Mission Optimization” Dr. Andras Sobester (University of Southampton)

10:10-10:40 “Aerodynamic Shape Optimization with Physics-based Surrogate Models” Dr. Emiliano Iuliano (CIRA)

10:40-11:10 “Discrete Viscous Adjoint Method for Solving Aerodynamic Shape Optimization Problems” Dr. Joel Brezillon (DLR)

11:10-11:30 (Coffee) Break

Session II: Special Lecture

11:30-12:30 “Recent Adjoint Method Developments Within the SU2 (Stanford University Unstructured) Framework: Low-Boom Design and Frameworks for Noise Minimization” (Stanford University)

12:30-13:30 Lunch

Session III:

13:30-14:00 “Cooperative and Competitive Algorithms for Aerodynamic Design Optimization Coupled with Other Disciplines” Dr. Jean-Antoine Desideri (INRIA)

14:00-14:30 “Multi-Disciplinary CFD-based Design Optimization for Turbomachinery Challenges using Surrogate Models at CENAERO” Dr. Ingrid Lepot (CENAERO)

14:30-15:00 “Shape Optimisation for Aerodynamic Design: the Airbus Vision and Perspectives” Dr. Matthieu Meaux (Airbus/EADS)

15:00-15:30 “Aerodynamic Shape Design Optimization: Recent Improvements and New Challenges” Dr. Gilbert Rogé (Dassault Aviation)

15:30-15:50 (Coffee) Break

Session IV:

15:50-16:35 “Local and Global Shape Optimization: Recent Experiences” Gérald Carrier and al. (Applied Aerodynamics Dept., ONERA)

16:35-17:20 “Future Aircraft Design: Recent Activities (at Tohoku University)”

1. Cartesian-based CFD/CAA Development for Future Aircraft Design (Dr. Daisuke Sasaki, Aerodynamic Design Group, Tohoku University)
2. Code Development of Linearized Euler Equation on Block-Structured Cartesian Mesh for Complicated Geometries (Yuma Fukushima, Tohoku University)
3. Data Compression Method for Large-Scale Flow Computation by Building-Cube Method (Ryotaro Sakai, Tohoku University)
4. Conceptual Design of the Next Generation Environmentally Responsible Aircraft Focusing on the Feasibility (Masaya Oshimizu, Tohoku University)

17:20-18:00 Discussions & Closing Remarks