

Description of the Platform

Aerospace Europe web platform (www.aerospace-europe.eu) will be used to enable a flexible and easy communication and handling of the Workshop related information and data. The initial information released by AIRBUS, and to be used by the contributors, is already available for downloading. Please follow the link to "Case Studies", and "A common platform for validation of aircraft drag reduction technologies".

Definition of the Database

A database will be set up within the Aerospace Europe web platform. It will store the results from each contributor, classified according the criteria defined by the evaluation purposes. Each contributor will have its own space, but will be able to consult and compare with results by other contributors. The information, data and results uploaded in this database will be the main source of comparison during the Workshop sessions. It will complement the presentations by each contributor.



International Centre for Numerical Methods in Engineering -
CIMNE Congress Bureau

Workshop Secretariat

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PADRI 2019

Barcelona, Spain, October 16-17, 2019
<http://congress.cimne.com/PADRI-2019>

Organized by



AIRBUS



CIMNE



ECCOMAS



PADRI 2019 PLATFORM FOR AIRCRAFT DRAG REDUCTION INNOVATION

Barcelona, Spain, October 16-17, 2019

Organizing Committee:

G. Bugeda (CIMNE)
J. Périaux (CIMNE)
D. Redondo (AIRBUS)
B. Stefes (AIRBUS)



Industry Interest Group event

After the first edition of the **PADRI ECCOMAS Thematic conference** (Barcelona 2017), a second round 2019 named PADRI2 targets new computational results with active/passive device flow technologies and/or optimization.

Format of the Workshop:

International invited lectures and contributors.

<http://congress.cimne.com/PADRI-2019>



Objectives

The main objective of the Open Workshop is to find candidate flow control technologies and optimization strategies that can minimize shock wave and interference drag in the strut-wing junction region in cruise condition.

A test case is proposed for computation that reproduces, even at low velocity, a typical shock wave pattern in the region of the junction strut-wing of an aircraft.

In order to simplify the problem, some constraints have been setup, so that the geometrical modifications should be confined to a defined small region around the strut-wing junction, and the objective function is clearly explained in order to ensure computational data results comparisons across all the technology solutions and participants.

A computational platform will allow all participants to compare on outputs and formats selected by organizers their respective data results installed on a Database with respect to the reference (baseline) and to show the benefit of the chosen flow control technology.

The Workshop intends to contribute to fill the gap between the different technology models and their application.

Organizing Committee

G. Bugada, CIMNE, Spain
J. Periaux, ECCOMAS IIG, CIMNE
D. Redondo, Airbus, Spain
B. Stefes, Airbus, Germany

Technical Committee

J.J. Alonso, Stanford, USA
N. Bier, DLR, Germany
R. Campbell, NASA, USA
H. Chen, Tsinghua, China
A. Styles, Airbus, UK

Platform and Database Administrators

S. Guttilla, Euromech, Italy
J. Pons Prats, CIMNE, Spain

Technical Description of the Workshop

Strut-wing test case is based on an unformatted geometry of an aircraft with long slender wing, which is supported by a strut. The initial geometry included the entire aircraft with tail and empennage, but simplifications were applied, discarding the empennage and tail, and considering symmetry.

The flow conditions are summarized as: Reynolds number over length $7.1 \times 10^6 \text{ m}^{-1}$, cruise altitude 30000ft on an atmosphere ISA+0 with pressure 30089.59 Pa, and temperature 228.71K.

The main focus should be put on the region of the strut-wing junction in the mentioned cruise conditions, analyzing the buffet condition in a range of Mach number and Angle of attack. in this particular region.

The definition of the best flow control device, which helps to delay buffet onset is the main objective and should be demonstrated through the analysis of the simulation results.

Due to the lack of common methodology for buffet onset detection criteria and the need of calibration for industrial application, the selected buffet onset detection criteria is focused on phenomena which are closely linked to buffet appearance and can be easily applied by any participant.

ECCOMAS Industry Interest Group (IIG)

The ECCOMAS Industry Interest Group (IIG) is actively promoting the PADRI 2019 Workshop.

IIG develops contacts between ECCOMAS in the DGs of the European Commission.

The high level objective of this workshop is to strengthen the ECCOMAS Industry Interest Group.

Format of the Workshop

The format of PADRI-2019 Workshop will combine plenary lectures on flow control design and optimization challenges for buffet control with individual presentations by worldwide contributors.

Each contributor will share its results, which will be compared thanks to the setup of a common database of the computational data and results.

In addition, a Round Table assessment of the contributions, with an international senior expert committee, will be organized at the end of the Workshop.

Location

The Barcelona of the 21st century is a city shaped by the '92 Olympics, a city transformed for and by the need to do justice to that great international event. The Barcelona we see around us now, the Barcelona we enjoy today, is a new Barcelona, Mediterranean in keeping with its traditions, with its face to the sea and its arms open to other cultures and peoples, giving and receiving, happy to make and to share its riches.

Registration Fees

**Contributors to the Workshop
(lunch and workshop dinner): 150 €**

Important Dates-Logistics aspects

- E-inscription of Interest Open: March 1, 2019
- Registration Payment Open: June 1, 2019
- Deadline for participation: September 1, 2019
- Set up of the Program: October 1, 2019

Technical aspects

- Database Opened: April 1, 2019
- Data Checks: September 1 - October 28, 2019
- Finalization of Contributing Period: September 15, 2019
- Open Workshop development: October 16-17, 2019

How to submit contributions

Authors are invited to submit individual contributions related to the test case and upload their simulation results on the database.

Registration

Workshop registration have to be performed electronically, via the conference website:

<http://congress.cimne.com/PADRI-2019/>