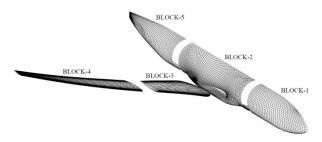
# **CFD Drag Prediction Workshop**

# Focus

The focus of this workshop will be to continue studies with the NASA Common Research Model (CRM) performed in DPW 4. Two series of computations are included:

- 1. Common Grid Study: A multi-block, O-O grid topology has been generated for the wina-body configuration. Each cell edge has been divided in two up to eight times successively to develop a gridrefinement sequence. The resulting cloud of points will be reformatted into overset and tet-based unstructured grids. Within this series of eight grids, there will be a suitable arid refinement sequence for most types of arids. Additional computations are requested with user-developed grids.
- <u>Buffet Study</u>: Alpha sweeps will be conducted at finely-spaced intervals through the zone where wing separation is expected to begin. Details of the exact CL-alpha combination for separation onset and patterns are to be reported.



# **CFD Drag Prediction Workshop**

# **Organizing Committee**

John Vassberg, Ben Rider, Mori Mani The Boeing Company

Ed Tinoco Retired

Olaf Brodersen, Simone Crippa DLR

Mitsuhiro Murayama JAXA

**Dimitri Mavriplis** University of Wyoming

Rich Wahls, Joe Morrison NASA Langley Research Center

David Levy, Kelly Laflin Cessna Aircraft Company

#### Dates

Check the DPW website for additional information and updates.

Finalize Test Cases	3Q, 2011
Release Standard Grids	4Q, 2011
Notification of Intent Due	10 Feb 2012
Acceptance Notification	24 Feb 2012
Registration will be handled through	
normal AIAA Procedures	
Data Submittal	27 April 2012
Workshop	23-24 June 2012

Workshop presentations will not be official AIAA papers; however, several participants will be invited to support a special session on drag prediction to be held during the AIAA Aerospace Sciences Meeting, January 2013.

# 5th AIAA CFD Drag Prediction Workshop

Sponsored by the Applied Aerodynamics TC

# 2-Day Workshop 23-24 June 2012 Preceding 30<sup>th</sup> APA Conference New Orleans, LA



For more information and results from past workshops, visit the DPW website at:

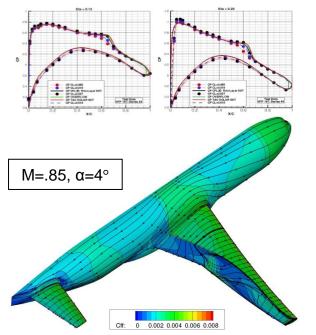
<u>http://aaac.larc.nasa.gov/tsab/cfdlarc/</u> <u>aiaa-dpw/</u>

> or send email to: aiaadpw@gmail.com

## **CFD Drag Prediction Workshop**

#### **Objectives**

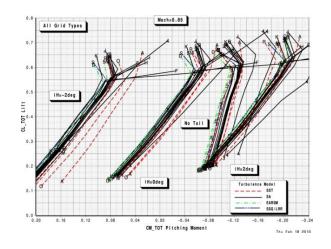
- To build on the success of past AIAA Drag Prediction Workshops.
- To assess the state-of-the-art computational methods as practical aerodynamic tools for aircraft force and moment prediction of industry relevant geometries.
- To provide an impartial forum for evaluating the effectiveness of existing computer codes and modeling techniques using Navier-Stokes solvers.
- To identify areas needing additional research and development.



# **CFD Drag Prediction Workshop**

#### **General Information**

- This workshop is open to participants worldwide. Efforts will be made to ensure representation from all areas of industry, academia and government laboratories.
- Participation in the drag studies is not required to attend the workshop. Everyone is welcome!
- Open forums will be included in the workshop to discuss the solutions and modeling techniques.
- Results will be made available after the workshop in a report and on the DPW website.
- A nominal registration fee will be required for attendance.
- AIAA membership is not required.



# CFD Drag Prediction Workshop

#### **Test Cases**

Check the DPW website for additional details and updates.

## Case 1

- 1. NASA CRM Wing-Body Configuration
- 2. Single Point Grid Sensitivity Study Mach = 0.85C<sub>1</sub> =  $0.500 \pm 0.001$
- 3. Grid refinement series from the Common Grid Sequence
- 4. Optional: Grid refinement series participantdeveloped grids

# Case 2

1. NASA CRM Wing-Body Configuration

2. Drag Polar

Mach = 0.85 α (Deg) = 2.50, 2.75, 3.00, 3.25., 3.50, 3.75, 4.00

For test case 1, the user will select appropriate grids (minimum of 4 grid levels) from the Common Grid Sequence to match the CFD code they use. The target grids should range from 3 to 50 million unknowns.

All participants are encouraged to build their own grids using 'best practice' techniques. IGES and CATIA models are available for grid construction. A family of grid sizes should be developed in the range described above suitable for Grid Sensitivity Analysis. All grids used for results presented at the workshop must be submitted to the DPW Organizing Committee to be made available to all interested parties. Results and grids will be published electronically on the DPW website:

http://aaac.larc.nasa.gov/tsab/cfdlarc/aiaa-dpw/