1st AIAA CFD High-Lift Prediction Workshop

Sponsored by the Applied Aerodynamics Technical Committee

Overview and Status

June 21st, 2009

Outline

- Background
- Organizing Committee
- Workshop Details
  - Goals and Objectives
  - Technical Plan
  - Working Schedule
- The Role of APA (How you can help…)

Background

- 2004-2006 – NASA begins discussing possibility of a High-Lift CFD prediction workshop focused on newly acquired Trap Wing data from the LaRC 14x22 Foot WT.
  - External support (e.g. Boeing, etc.) grows during this timeframe
  - Initial thought is to have workshop organized and administered by NASA
- 2006-2007 – Idea of having the workshop organized through AIAA (specifically APA) gains traction, and high-level discussions are held within the APA Vehicle Aerodynamics subcommittee
- Late 2008 – Support for workshop through AIAA is obtained from NASA and key external organizations
- Orlando 2009 – Official kick-off of workshop and formation of organizing committee

Organizing Committee

- Jeffrey Slotnick and Tony Sclafani
  The Boeing Company
- Rob Lotz
  CD-adapco
- Mark Chaffin and David Levy*
  Cessna Aircraft Company
- Ralf Rudnik
  DLR
- Thomas Wayman
  Gulfstream Aerospace Corporation
- Judi Hannon and Chris Rumsey
  NASA Langley Research Center
- Bob Stuever and Chittur Venkatasubban
  Hawker Beechcraft
- Dmitri Mavriplis*
  University of Wyoming

*** DPW organizing committee member**

Goals and Objectives

- Assess the numerical prediction capability (meshing, numerics, turbulence modeling, high-performance computing requirements, etc.) of current-generation CFD technology/codes for swept, medium-to-high-aspect ratio wings for landing/take-off (high-lift) configurations.
- Develop practical modeling guidelines for CFD prediction of high-lift flow fields.
- Advance the understanding of high-lift flow physics to enable development of more accurate prediction methods and tools.
- Enhance CFD prediction capability for practical high-lift aerodynamic design and optimization.

Technical Plan

- For the first workshop (HiLiftPW-1), the NASA Trapezoidal (“Trap”) Wing high-lift model geometry and test data will be used
  - Represents essential problems encountered in high-lift aerodynamics
  - Publically available data collected during NASA Advanced Subsonic Technology (AST) Program in 1998, and subsequent NASA Langley test campaigns in 2002 and 2003
  - A fair amount of experience with the Trap Wing already exists – presents opportunity to “sharpen the pencil” and critically evaluate emerging CFD technologies for high-lift flows.
  - HiLiftPW-1 being patterned after successful Drag Prediction Workshop (DPW) series of open CFD evaluation studies.

Working Schedule

- 2-day workshop tentatively scheduled for APA Summer 2010 (Chicago)
  - ✓ Website launch (1Q 2009)
  - ✓ Geometry available (2Q 2009)
  - ✓ Publicize at 2009 Summer Meeting (San Antonio) - Flyer
  - Grids available (3Q-4Q 2009)
  - Publicize at 2010 ASM (Orlando)
  - Abstracts due (1Q 2010)
  - Acceptance notification (1Q 2010)
  - Data submittal (2Q 2010)
  - Registration (2Q 2010)

Roles and Responsibilities

- AIAA
  - Provide meeting logistics (room, projector, etc.)
  - Workshop promotion (“call-for-papers”, preliminary program, etc.)
- APA
  - Limited, up-front costs associated with executing the workshop (perhaps continental breakfast and snacks, etc.)
  - Workshop momento (note portfolios, akin to DPW-1, etc.)
  - Provide technical support for special sessions to report accomplishments and lessons learned
  - *Encourage technical community and network to participate in workshop*

Workshop fee will be nominally $200/person

The World's Forum for Aerospace Leadership