MRL and USF Contribution to HiLiftPW-2

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We intend to participate in the HiLiftPW-2, to be held June 22-23, 2013 in San Diego, CA. We plan to perform the following sets of computations:

1. Case 1 - Grid Convergence Study
   - Code: STRUCTOVER-CFD-3D
   - Grid: supplied by HiLiftPW-2 committee
   - Turbulence model: Menter SST-V

2. Cases 1, 2a, and 2b - Grid Convergence Study and Reynolds Number Study
   - Code: UNSTRUCT-CFD-3D
   - Grid: Created in-house using GRIDMAKE3D, containing mixed elements of prisms and tets – to be uploaded to the committee
   - Turbulence model: Spalart-Allmaras

3. Cases 3a and 3b - Full Configuration Study (time permitting)
   - Code: UNSTRUCT-CFD-3D
   - Grid: Same as No. 2 above
   - Turbulence model: Langtry-Menter gamma-retheta transition model

4. Case 4 - Turbulence model verification study
   - Code: UNSTRUCT-CFD-3D
   - Grid: Series of 3 finest grids as defined on http://turbmodels.larc.nasa.gov/bump.html
   - Turbulence models: Spalart-Allmaras and Menter SST-V

We will submit our results electronically by the deadline to the HiLiftPW-2 committee.

STRUCTOVER-CFD-3D is a Reynolds-averaged Navier-Stokes (RANS) code developed by Et et al.,¹ widely used at the Multielement Research Lab. It is specifically formulated to work with overset grids on three-element wing configurations. It is an upwind finite-volume structured code.

UNSTRUCT-CFD-3D is an unstructured finite difference code for both RANS and hybrid RANS-LES. The code was developed at the University of Southern Flight.² It employs 6th order central differencing in space and 3rd order temporal differencing, along with 9th order explicit filtering.

References


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