HLPW-4: R-008 Submission

R-008.FUN3D/

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├── R-008.1_FUN3D_SA_Grid-D2.2_BESTPRACTICE (SA, D Mesh, All requested data)
│   ├── R-008.1_OffBodyVorticity
│   └── R-008.1_SurfaceFlowVisualizations
├── R-008.2_FUN3D_SA-QCR2000_Grid-D2.2 (SA-QCR2000, D Mesh, Subset of requested data)
│   ├── R-008.2_OffBodyVorticity
│   └── R-008.2_SurfaceFlowVisualizations
├── R-008.3_FUN3D_SA_Grid-A1.2 (SA, A Mesh, Subset of requested data)
│   └── R-008.3_SurfaceFlowVisualizations
├── R-008.4_FUN3D_SA_Grid-B2.2 (SA, B Mesh, Subset of requested data)
│   └── R-008.4_SurfaceFlowVisualizations
├── R-008.5_FUN3D_SA_Grid-C1.2 (SA, C Mesh, Subset of requested data)
│   └── R-008.5_SurfaceFlowVisualizations
├── R-008.6_FUN3D_Verification (SA, SA-neg, SA-neg-RC, SA-neg-QCR2000, SA-neg-RC-QCR2000)
└── Slides (Some sample plots)
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SOLVER INFORMATION:

Solver Name and Version: FUN3D Version 13.7

Basic Algorithm: Unstructured. Node-centered Finite Volume. Second-order accurate. Computation of viscous fluxes on tetrahedral meshes is based on the Green-Gauss theorem and on nontetrahedral grids, an edge-derivative augmentation is employed to avoid odd-even decoupling. Time integration toward a steady state is based on a backward-Euler scheme with local time-stepping to accelerate convergence.

Runs Description: Started from freestream. No initial first-order iterations. Steady-state. Simulations are "free-air" using committee provided free-air grids. Simulations are fully-turbulent. Roe solver used with no flux limiting. Exceptions to the above description are the 20.55° runs on C and D grids which were restarted from the 19.57° solutions.

Turbulence Models: SA, SA-QCR2000

Transition Method: N/A

Convergence Criteria: Very small change in forces/moments.

Miscellaneous: https://fun3d.larc.nasa.gov/

Case 1a

Name of committee-supplied grid used:

HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-D_PW_V2_Q1.b8.ugrid
HLPW-4_CRM-HL_37-34_v1a_Unstr-Tets-Prisms_Level-D_PW_Smoothed.b8.ugrid
HLPW-4_CRM-HL_43-40_v1a_Unstr-Tets-Prisms_Level-D_PW_Smoothed.b8.ugrid

"TYPICAL" SOLUTION PERFORMANCE INFORMATION

Grid size: 202542838
Computer Platform: NAS (Skylakes)
Number of Processors: 4080
Operating System: Linux
Compiler: Intel
Run Time CPU: N/A
Run Time Wall-Clock: ~52 hours
Memory Requirements: Real Memory Used: 51741624kb
Convergence Details: Convergence data is provided
Miscellaneous: N/A

Case 1b

Name of committee-supplied grid used:

HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-A_PW_V2.b8.ugrid
HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-B_PW_V2_Q1.b8.ugrid
HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-C_PW_V2.b8.ugrid
HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-D_PW_V2_Q1.b8.ugrid

Case 2a

Name of committee-supplied grid used:

HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-A_PW_V2.b8.ugrid
HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-B_PW_V2_Q1.b8.ugrid
HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-C_PW_V2.b8.ugrid
HLPW-4_CRM-HL_40-37_Nominal_v1a_Unstr-Tets-Prisms_Level-D_PW_V2_Q1.b8.ugrid

Case 3

Name of committee-supplied grid used (downloaded from the TMR website):

crmhl_1.b8.ugrid
crmhl_2.b8.ugrid
crmhl_3.b8.ugrid
crmhl_4.b8.ugrid
crmhl_5.b8.ugrid
crmhl_6.b8.ugrid
crmhl_7.b8.ugrid

Turbulence Models:

SA, SA-neg, SA-neg-RC, SA-neg-QCR2000, SA-neg-RC-QCR2000