

2024 September 17, 2024

Participants: ~37

Brent's update presentation

Test case 1, ONERA OAT15A workshop-wide validation case. Feeding Scatter Working Group.

Test case 2, unsteady CFD and rigid wing (no FSI), detailed comparisons with JAXA data. Start off around end of 2024.

Test case 3, unsteady CFD with FSI, detailed comparisons with JAXA data. Start off around summer 2025.

Student participation. Minimum content for submission ONERA OAT15A on coarsest grid, 3 angles of attack.

Q&C:

Sebastian Timme: about test case 3, do JAXA data have deformation measurements?

Andrea Sansica: Deformation measurements are not available.

Bret Stanford: are the gauge measurements from wing root or sting?

Andrea: From wing root gauge measurements.

Bret: That is good, it can give us some information about bending moment.

Update from Cadence (Claudio Pita)

New set of grids, structured and unstructured grids. Fixed the discrepancy between grids and geometry (wall points all fall on the airfoil geometry). After a sanity check, will be uploaded soon.

Silva Walter: are the grids based on CAD design?

Fulvio Sartor: airfoil was designed by ONERA, created the model based on the points, there are no CAD files.

Walter: would be good to have a comparison between as designed and as manufactured

Fulvio: there are some differences but below the tolerance of manufacturing.

Update from HeldenAero (Rick Hooker)

Mesh outer boundary at 100 chord lengths in all directions, 10% chord 1-cell wide.

6-member family mesh. Coarse and refine from Medium grid. Current mesh family extends the refinement region and added refinement in the wake.

Caludio Pita: initial height in Cadence computed from guidelines, where to the numbers for HeldenAero come from?

Rick: target  $y^+=1$  for medium grid, and then coarsen and refine from there.

Massey Steve: can we extrude the 2D grids for 3D multiple planes, i.e. for DDES?

Rick: yes, we can. We will follow up.

Update from Steve Massey

New runs with the new CAD geometry. Similar results, but there are some differences, i.e. in skin-friction.

Mini-Workshop 1

Open-to-all mini-workshop, Thursday January 9<sup>th</sup> 9:30-12:00 at Scitech, Bayhill 29, Hybrid

Content: updates from all seven working groups, presentation of ONERA OAT15A data. OC presentations and updates.

Bret Stanford: will participants present or submit their data and collected/presented by OC?

Brent: collected/presented by OC and we have a github to gather data.

DPW-8 Scatter GitHub Repository

Centralized location for submitting results. Maintain historical record of data submissions. Sub-directories for each participants.

Updates from Jeffrey Housman

LAVA update

Grid from Sebastian Deck (ONERA), from original JCP 2020 paper. Extruded to 0.2 chord in span with 145 points (as in JCP 2020). Started ZDES Mode 2 (2020) at  $AoA=3.5deg$  with as similar setup as in JCP 2020 (dt equivalent to 4773 time steps per CTU). Grid is 58M grid points. 50 chords outer boundary. On JCP ran over 200 CTUs, now still running on LAVA. Lower amplitude and frequency content. Similar level of accuracy in terms of  $C_p$ . Time-step sensitivity study, using a larger time step more typical for LAVA, 100-500 time-steps per CTU. 100 time-steps per CTU mean and amplitude are wrong, time-averaged shock location sharp and over-prediction of separation bubble, lower  $Prms$ . Damping effect on the resolved turbulent structures downstream of the shock. Similar results between 4773 and 1000 time steps per CTU. For the RANS, transition model vs fully turbulent, no significant differences.