

Buffet working group meeting 2024 August 20

Attendees ~40

- Brent's presentation

14 people involved in other working groups; website updates; brief summary of in-person meeting at AIAA Aviation, slides uploaded to the dpw website

Static temperature correction for ONERA OAT15A test case

OAT15A will support scatter working group, led by Marshall Galbraith (MIT) and Kevin Holst (UoT/CREATE-AV). Scope, RANS centric, snapshot of best-practice within the field; flavor of SA recommended.

Update from sub-groups:

URANS (Brent, Fulvio): 10 participants, plan to use RANS grids for URANS until further notice

HRLES (Jeff): 10 participants, description of test cases, brief discussion on grids

WMLES & beyond (Johan): 10 teams, introduction of teams, discussion on OAT15A case not being relevant for WMLES so probably WMLES teams will focus on full aircraft

Update from Jeff on HRLES:

RANS with LAVA, SA-neg committee-supplied structured PW grids; 2nd order discretization, ILU pre-conditioned GMRES, CFL ramping 1 to 1000, convergence of criteria 10 orders of magnitude

Aerodynamic forces vs alpha, aerodynamic forces vs grid ($1/N$), from C_p the shock is predicted further downstream wrt the experiments; sensitivity study on different SA corrections, best prediction with SARC-CC-QCR2000-lowRe with good C_p prediction pre-

onset for finest grid near shock but worse near TE; large differences in aerodynamic forces between SA-neg and SARC-CC-QCR2000-lowRe; SA-neg over-predicts separation; eddy viscosity ratio shows some differences in the pressure side near TE; grid does not follow the geometry near LE and TE.

Claudio from Cadence: differences in the geometry may be just single precision differences.

Jeff will re-run the cases with the correct temperature and then upload C_p , C_f and aerodynamic forces.

Pawel: there are some differences on the geometry between the PW and HM grids

Back to Brent's presentation:

Info on test case 2 Update

Jeff asked about experimentally measured geometries for both post-buffet and pre-buffet conditions. Geometries at post-buffet conditions will be provided for the two angles of attack of interest. The geometries at pre-buffet conditions can also be provided but come from a campaign using a differently instrumented wing.