Evaluation of bespoke and commercial CFD methods for a UCAV configuration

A series of Reynolds-averaged Navier-Stokes (RANS) computations has been performed using block-structured meshes to compare the accuracy of two commercial CFD flow solvers and a bespoke tool in use at QinetiQ. These calculations have been compared with experimental measurements of surface pressure and overall forces and moments. In addition, further calculations have been performed for the cases selected by TTCP for a study of the flow development and its effect on the vehicle stability. These calculations include an initial study of the effects of mesh fineness and also of the importance of incorporating transition modelling when comparing computed results with those obtained experimentally without transition fixing. The study aids the validation of computational methods and the benchmarking of capability.

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