Implicit Large Eddy Simulation of a wingtip vortex at Re$_c$ =1.2x10^6[1] JEAN-ELOI LOMBARD, DAVE MOXEY, SPENCER SHERWIN, Imperial College London, SHERWINLAB TEAM[2] — We present recent developments in numerical methods for performing a Large Eddy Simulation (LES) of the formation and evolution of a wingtip vortex. The development of these vortices in the near wake, in combination with the large Reynolds numbers present in these cases, make these types of test cases particularly challenging to investigate numerically. To demonstrate the method's viability, we present results from numerical simulations of flow over a NACA 0012 profile wingtip at Re$_c$ = 1.2 x10^6 and compare them against experimental data, which is to date the highest Reynolds number achieved for a LES that has been correlated with experiments for this test case. Our model correlates favorably with experiment, both for the characteristic jetting in the primary vortex and pressure distribution on the wing surface. The proposed method is of general interest for the modeling of transitioning vortex dominated flows over complex geometries.

[1]McLaren Racing/Royal Academy of Engineering Research Chair
[2]www.sherwinlab.info

Spencer Sherwin
Imperial College London

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