14th World Congress on Computational Mechanics (WCCM XIV)
8th European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS 2020)
July 19- 24, 2020, Paris, France

WALL-MODELLED LARGE-EDDY SIMULATION

TRACK NUMBER 600 – FLUID DYNAMICS AND TRANSPORT PHENOMENA

MATTIAS LIEFVENDAHL [*†], RICKARD E. BENSOW [†]
AND TIMOFEY MUKHA [†]

[*] Swedish Defence Research Agency (FOI)
Gullfossgatan 6, SE-164 40 Kista, Sweden
Mattias.liefvendahl@foi.se, www.foi.se

[†] Chalmers University of Technology
Chalmersplatsen 4, SE-412 96 Göteborg
Rickard.bensow@chalmers.se; Timofey@chalmers.se; www.chalmers.se

Key words: Wall-bounded turbulence, Computational Fluid Dynamics, Turbulence modelling, Wall models.

ABSTRACT

Wall-modelling has long been identified as a key technique for the application of large-eddy simulation to engineering flows, [1]. The fundamental reason being that it alleviates the restrictive grid requirements of resolving the very near-wall flow in wall-bounded turbulence, leading to orders of magnitudes in saving in computational cost for many application areas, for e.g. ship hydrodynamics, see [2]. Despite this fact, the number of examples of its use in applications is surprisingly small, and fundamental questions concerning predictive accuracy for different types of flows are not yet fully resolved. Because of this, and the very important potential of the technique for applications, the research area has recently seen significant developments, [3].

The minisymposium invites contributions on all aspects of wall-modelled LES (WMLES), including; (i) Model development, (ii) validation studies of WMLES for different flows, and (iii) applications of the technique to engineering flows.

REFERENCES

[1] D. R. Chapman, "Computational aerodynamics, development and outlook", *AIAA Journal*, Vol. **17**, pp. 1293–1313, (1979).

[2] M. Liefvendahl and C. Fureby, "Grid requirements for LES of ship hydrodynamics in model and full scale", *Ocean Engineering*, Vol. **1**43, pp. 259–268, (2017).

[3] S. T. Bose and G. I. Park, "Wall-modeled large-eddy simulation for complex turbulent flows", *Ann. Rev. Fluid Mech.*, Vol. **50**, pp. 535–561, (2018).