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VERIFICATION AND VALIDATION FOR THE LARGE EDDY SIMULATION OF INCOMPRESSIBLE TURBULENT FLOWS WITH FENICS

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Abstract. We describe a framework for verification and validation in the frame of the development of turbulence models for the Large Eddy Simulation of incompressible flows, by means of residual-based subgrid stabilisation.
The main components consist of a posteriori error estimation of the numerical error, uncertainty quantification of data and modeling errors, and systematic verification of the software implementation in FEniCS (www.fenicsproject.org) by manufactured solutions.
We introduce the different components, and present the combined framework in a number of examples .