CURRENT TRENDS IN MODELLING AND SIMULATION OF TURBULENT FLOWS

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Computational Fluid Dynamics (CFD) has developed to a key technology which plays an important role in design, development and optimization in engineering practice. The role of the ERCOFTAC SIG15 (Special Interest Group for Turbulence Modelling) is closely connected to intensive verification and systematic validation of CFD (Computational Fluid Dynamics) technology for solving the problems of both fundamental importance and industrial relevance. This task has been accomplishing for years in the form of a series of computational workshops (fifteen workshops have been hitherto organized; see www.ercoftac.org under SIG15) aimed at evaluating predictive capabilities of turbulence models at the RANS, LES and hybrid LES/RANS level in a broad range of well-documented flows of scientific and industrial relevance. Focus is on the credibility and reliability of both the numerical methods and mathematical models simulating turbulence. In such a way a large database of simulation results along with detailed comparison with the reliable reference data (experimental, DNS and highly-resolved LES databases) has been assembled.

In addition to this prime objective the SIG15 initiated a series of mini symposiums on "*Current Trends in Modelling and Simulation of Turbulent Flows*". The first two such symposiums were held in Lisbon, Portugal on June 14-17, 2010 in the framework of the "*5th European Conference on Computational Fluid Dynamics - ECCOMAS CFD 2010*" and Vienna, Austria on September 10-14, 2012 in the framework of the "*6th European Congress on Computational Methods in Applied Sciences and Engineering - ECCOMAS 2012*". The mini symposium should promote the discussion and conclusions about rationale and predictive performance of variety of statistical turbulence models (in the Reynolds-averaged Navier-Stokes - RANS - framework), SGS models in the LES (Large-eddy Simulation)-framework, hybrid LES/RANS models as well as other computational models in conjunction with relevant numerical treatment in a broad range of well-documented turbulent flow configurations under the scientists, researchers, users and developers from industry and from the academic field.

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