3rd Workshop on CFD Uncertainty Analysis

Lisbon, 23rd and 24th of October 2008
Instituto Superior Técnico
Lisbon

Objective ： Perform a Verification and Validation study for a steady, incompressible, turbulent flow and assess the quality of the procedures available for Solution Verification and Validation

Required computations:
- a) Code Verification for a 2-D Manufactured Solution (MS)
- b) Verification of Calculations (Solutions) and Validation for the 2-D Flow over a Backward Facing Step (BFS), (Ercoftac C30)

A manufactured solution for a near-wall flow with FORTRAN functions including all information for several eddy-viscosity turbulence models is available from the organization.

Grids and boundary conditions are free for BFS, but must conform with the experiment. Inlet profiles fitted to the experimental data are available from the organization (on request).

Required from participants:
- Code Verification (MS):
  - ➢ Determine numerically the Manufactured Solution on various grids to demonstrate the order of accuracy of the numerical solution.
- Verification of Calculations (BFS):
  - ➢ Obtain benchmark solutions (preferably in the asymptotic range) to allow the evaluation of procedures for error estimation.
  - ➢ Estimate the uncertainty of the solution functionals and of the flow variables at pre-defined locations in coarse grids.
  - ➢ Test uncertainty estimation procedures by the overlap of the error bars obtained in the coarse grids with the benchmark solution.
- Validation
  - ➢ Apply the ASME V&V20 validation procedure[*] with the experimental data. The straightforward steps will be supplied.

* ASME V&V20, Verification and Validation for Computational Fluid Dynamics and Computational Heat Transfer, to appear.

More information available by request to: eca@marine.ist.utl.pt