

Numerical Simulation of the Backward-Facing Step in a Beowulf-Class Cluster

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This present work proposal is to present a three-dimensional numerical simulation of the classical flow over a backward-facing step problem in a very fine mesh. The in-house parallel numerical code was written in Fortran 90 and has solved the Navier–Stokes Equations discretised by the FVM and has run in a Beowulf-class cluster of PCs. The flow Reynolds number was 28000, a LES turbulence modelling technique was employed with Smagorinsky's subgrid model. Several flow properties were analyzed, that is, the reattachment length, the velocity profiles, the stream and spanwise vorticities, and the Strouhal number in several points downstream the domain. The results were compared against the literature.

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