AN IMPROVED WALL FUNCTION FORMULATION OF REALIZABLE K-EPSILON MODEL FOR WALL BOUNDED NATURAL CONVECTION

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Abstract Turbulence in buoyancy driven flows with large body forces is being generated in a non-isotropic manner. Therefore, Large Eddy Simulation (LES) and Reynolds Stress Model (RSM) approaches are commonly preferred by Computational Fluid Dynamics (CFD) practitioners. However, the implementation of LES and RSM is limited by the complexity of geometry, as a result of computational requirements of these approaches for a satisfying result. For complex geometries, two-equation models (k-ε, k-kl, k-ω^2, low Re k-ε) are shortlisted as alternatives to these high computational resources requiring approaches. Also, the flows in which body forces are significant should be treated carefully. This paper covers the development of improved wall functions for wall bounded natural convection. The results obtained by improved wall functions are validated by experiments and compared with LES, RSM and non-modified realizable k-ε model.