Ruxin Dai

Comparison of Two Higher Order Compact Computation Strategies for Handling Boundary Layers

700 woodland Ave E106
Lexington
KY 40508
USA
rda222@uky.edu
Ruxin Dai
Yin Wang
Jun Zhang
Yongbin Ge

Two fourth order compact (FOC) schemes with transformation method and non-transformation method to solve the two dimensional convection diffusion equations with boundary layers are compared. The domain is discretized on a stretched nonuniform grid. A grid transformation technique maps the nonuniform grid to a uniform one, on which the difference scheme is applied. A transformation-free scheme on nonuniform grids does not involve any transformation. A multigrid method is used to solve the resulting sparse linear systems from both methods. We compare the accuracy of the computed solutions and the robustness and efficiency of two schemes through comparison of maximum absolute errors, order of accuracy and CPU timings.