4 order Compute program result !

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Grid size: 11x11

Grid spacing: dx = 0.1, dy = 0.1

Program execution started with improved 4th order scheme....

Setting boundary conditions...

Setting interior points with consistent 4th order scheme...

Matrix initialization completed.

Total equations: 121

Interior 4th-order points: 49

Iteration = 0, Convergence error = 5.500e+00, L1 error = 8.385e+00

VTK document output: FDM_diffusion_2D_improved_11x11_000000.vtk

Steady state reached!

Final iteration: 829, Final convergence error : 9.935e-11

Final L1 error: 2.156e-04

VTK document output: FDM_diffusion_2D_improved_11x11_000829.vtk

Grid size 11x11 computation completed

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Grid size: 21x21

Grid spacing: dx = 5.000e-02, dy = 5.000e-02

Program execution started with improved 4th order scheme....

Setting boundary conditions...

Setting interior points with consistent 4th order scheme...

Matrix initialization completed.

Total equations: 441

Interior 4th-order points: 289

Iteration = 0, Convergence error = 5.500e+00, L1 error = 9.195e+00

VTK document output: FDM_diffusion_2D_improved_21x21_000000.vtk

Iteration = 1000, Convergence error = 1.486e-04, L1 error = 8.189e-03

Iteration = 2000, Convergence error = 2.025e-07, L1 error = 1.143e-05

Iteration = 3000, Convergence error = 2.760e-10, L1 error = 1.732e-05

Steady state reached!

Final iteration: 3154, Final convergence error : 9.991e-11

Final L1 error: 1.733e-05

VTK document output: FDM_diffusion_2D_improved_21x21_003154.vtk

Grid size 21x21 computation completed

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Grid size: 41x41

Grid spacing: dx = 2.500e-02, dy = 2.500e-02

Program execution started with improved 4th order scheme....

Setting boundary conditions...

Setting interior points with consistent 4th order scheme...

Matrix initialization completed.

Total equations: 1681

Interior 4th-order points: 1369

Iteration = 0, Convergence error = 8.800e+00, L1 error = 9.296e+00

VTK document output: FDM_diffusion_2D_improved_41x41_000000.vtk

Iteration = 1000, Convergence error = 2.023e-03, L1 error = 2.364e-01

Iteration = 2000, Convergence error = 7.516e-05, L1 error = 8.780e-03

Iteration = 3000, Convergence error = 2.792e-06, L1 error = 3.250e-04

Iteration = 4000, Convergence error = 1.037e-07, L1 error = 1.104e-05

Iteration = 5000, Convergence error = 3.854e-09, L1 error = 8.451e-07

VTK document output: FDM_diffusion_2D_improved_41x41_005000.vtk

Iteration = 6000, Convergence error = 1.432e-10, L1 error = 1.202e-06

Steady state reached!

Final iteration: 6109, Final convergence error : 1.000e-10

Final L1 error: 1.207e-06

VTK document output: FDM_diffusion_2D_improved_41x41_006109.vtk

Grid size 41x41 computation completed

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Grid size: 81x81

Grid spacing: dx = 1.250e-02, dy = 1.250e-02

Program execution started with improved 4th order scheme....

Setting boundary conditions...

Setting interior points with consistent 4th order scheme...

Matrix initialization completed.

Total equations: 6561

Interior 4th-order points: 5929

Iteration = 0, Convergence error = 1.320e+01, L1 error = 9.588e+00

VTK document output: FDM_diffusion_2D_improved_81x81_000000.vtk

Iteration = 1000, Convergence error = 4.802e-03, L1 error = 1.026e+00

Iteration = 2000, Convergence error = 7.555e-04, L1 error = 1.610e-01

Iteration = 3000, Convergence error = 1.186e-04, L1 error = 2.527e-02

Iteration = 4000, Convergence error = 1.861e-05, L1 error = 3.966e-03

Iteration = 5000, Convergence error = 2.920e-06, L1 error = 6.222e-04

VTK document output: FDM_diffusion_2D_improved_81x81_005000.vtk

Iteration = 6000, Convergence error = 4.581e-07, L1 error = 9.757e-05

Iteration = 7000, Convergence error = 7.189e-08, L1 error = 1.524e-05

Iteration = 8000, Convergence error = 1.128e-08, L1 error = 2.326e-06

Iteration = 9000, Convergence error = 1.770e-09, L1 error = 3.228e-07

Iteration = 10000, Convergence error = 2.778e-10, L1 error = 6.179e-08

VTK document output: FDM_diffusion_2D_improved_81x81_010000.vtk

Steady state reached!

Final iteration: 10552, Final convergence error : 9.994e-11

Final L1 error: 6.040e-08

VTK document output: FDM_diffusion_2D_improved_81x81_010552.vtk

Grid size 81x81 computation completed

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Data file output: grid_convergence_4order_improved.dat

Gnuplot script output: plot_convergence_4order_improved.plt

=== Improved Grid Convergence Analysis ===

Linear regression results:

Slope = 3.925 (xe7x90x86?xe5x80xbc 4.0)

Order of accuracy = 3.925

All computations completed!