Vienna University of Technology

Numerical Simulation and Scientific Computing II

Institute for Microelectronics

NSSC II - Exercise 1 - Task 3

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Two Dimensional Decomposition of Ω

As in Task 2, the existing Jacobi Stencil solver from NSSC1 was modified to use `MPI` for parallelization and the unmodified solver as standard for comparison of our output. For the 2D decomposition `MPI_Dims_create` , `MPI_Car_create` and accompaning functionalities was used. The 1D decomposition was simply achieved with a restriction imposed on `MPI_Dims_create`. For the communication of the ghost layers nonblocking Sends with blocking Receives were used. In difference to the version of Task 2, the solutions from the single processes are not accumulated in the end and only the errors for the complete domain are computed. While the power of using `MPI` was observed it was also noticed in the end that for a more efficient program the parallelization with `MPI` would need to be planned from the start as in difference to the `openMP` parallelization of NSSC1 the existing code needed a lot of adaption.