

Multigrid methods

- The web page, link Multigrid methods:
link http://msekcce.karlin.mff.cuni.cz/~dolejsi/Vyuka/NS_source/MG/index.html
files: [MG.f90](#), [Makefile](#), [mg.data](#)
- Go through the code `MG.f90` to see the algorithmization of two-grid method
- Using the code `MG.f90`, reproduce the smoothing property of Jacobi solver. What does happen if we put $\mathbf{u}_h^0 = 0$ (initial approximation)?
- Using the code `MG.f90`, compare MG method with the direct solver and the iterative solver on the coarse grid level.
- Using the code `MG.f90`, try the restriction operator given by

$$d_{2h,i} := d_{h,2i}, \quad i = 1, 2, \dots, (N-1)/2.$$

- Modify the code and test it for the Jacobi method without the damping.
- Modify the code and test it for the Gauss-Seidel method.