

CNASC Seminar

Speaker

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An Introduction to Multigrid Methods

Abstract:

In this lecture, I will give an introduction to multigrid methods (MG), especially focusing on geometric multigrid. Multigrid methods are popular solution algorithms for many discretized PDEs, either as standalone iterative solvers or as preconditioners, due to their high efficiency. Two main components in MG are the coarse-grid correction operator and relaxation scheme. I will focus on these two aspects. Finally, I will use the Stokes equations as an example to explain how to apply multigrid method to solve the discretized system. Discretization and relaxation scheme will be discussed. Moreover, I will show how to implement the multigrid code in Matlab, where two-grid, V-cycle, W-cycle and F-cycle are included.