Serial and Parallel Iterative Splitting Methods: Algorithms and Applications

Jürgen Geiser (Ruhr-University of Bochum, Bochum, Germany), J.L.Hueso, E.Martinez,

In the lecture, we discuss the ideas of serial and parallel iterative splitting methods. The ideas and properties of iterative splittig methods with serial versions have been studied since recent years. We extend the itertative splitting methods to a class of parallel versions, which allow to reduce the computational time and keep the benefit of the higher accuracy with each iterative step.
We present the novel parallel splitting methods, which are nowadays important to solve large problems. While decomposing into simpler subproblems, such subproblems can be computed independently with the different processors.
We discuss the numerical convergence of the serial and parallel iterative splitting methods. Then, we present different numerical applications based on convection-diffusion problems to validate the benefit of the parallel versions.