

Lecture 1: Introduction to Domain Decomposition Methods

We present some basic ideas of domain decomposition for solving the Poisson equation. In particular, we show how from matching conditions for traces and fluxes, we can derive some nonoverlapping domain decomposition methods of iterative substructuring type.

Lecture 2: Neumann-Neumann Domain Decomposition Algorithm: convergence results

This lecture is devoted to Dirichlet-Neumann and Neumann-Neumann methods. Recent research has established more and more connections between the two classes of methods. We present the variational formulations of these algorithms and their analysis together.

Lecture 3: Domain Decomposition Algorithm for Contact Problems: Numerical results.

Contact problems take an important place in the computational mechanics. The discretization of such problems leads to very large and ill-conditioned systems. Domain decomposition methods represent a possible remedy to overcome this difficulty. In this lecture Neumann-Neumann algorithm is extended to contact problems. Numerical results illustrate scalability of the algorithm for some choices of the relaxation parameter.