Mathematisches Seminar

des Sonderforschungsbereichs 393

Numerische Simulation auf

massiv parallelen Rechnern

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Ort: Reichenhainer Straße 70, B202

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Thema: **Multilevel preconditioning operators on locally modified grids**

Systems of grid equations that approximate elliptic boundary value problems on locally modified grids are considered. The triangulation which approximates the boundary with second order of accuracy is generated from an initial uniform triangulation by shifting nodes near the boundary according to special rules. This *locally modified* grid possess several significant features:

1. this triangulation has regular structure;
2. generation of the triangulation is rather fast;
3. this construction allows to use BPX-like methods.

The iterative method for solving the elliptic boundary value problems approximately is based on two approaches:

1. the fictitious space method, i.e. the reduction of the original problem to a problem in an auxiliary (fictitious) space, and
2. the multilevel decomposition method, i.e. the construction of preconditioners by decomposing functions on hierarchical grids.

The convergence rate of the corresponding iterative process with the preconditioner obtained is independent of the mesh size.

Interessenten sind herzlich eingeladen.

A. Meyer