



Institute of Information and Communication Technologies – BAS

Seminar
„Parallel Algorithms and Scientific Computations”

On 11 December 2012 at 14:00 in room 218 at the Institute of Information and Communication Technologies, BAS, Acad. G. Bonchev St., Block 25 A, **Maria Lymbery** will give a presentation on the following topic:

Robust multilevel preconditioning of quadratic FE discretizations of anisotropic elliptic problems

This talk discusses the construction of multilevel preconditioners based on approximate block factorization for quadratic finite element (FE) discretizations of anisotropic elliptic problems.

Robustness with respect to non-grid-aligned anisotropy is obtained as a result of the interplay between the following components: (a) an additive Schur complement approximation attained via the assembly of exact Schur complements of local (stiffness) matrices associated with a covering of the entire domain by overlapping subdomains; (b) a global block smoother, such as a block Jacobi or a block Gauss-Seidel iteration; (c) the use of an augmented coarse grid enhancing the efficiency of the smoother on the coarse level(s).

The presented two-grid analysis and the performed numerical experiments with a nonlinear algebraic multilevel iteration (AMLI) method indicate the robust performance of this class of preconditioners.