

MATEMATICKÉ SEMINÁŘE

KMA FP TUL

INCOMPLETE VARIANTS OF THE GENERALIZED GRAM-SCHMIDT PROCESS IN CONTEXT

Pondělí 6. 3. 2023 od 14:20 hodin, Zasedací místnost DFP (4. patro budovy G, Univerzitní nám. 1410/1, Liberec)

+ on-line na Google Meet: <https://meet.google.com/gva-ipaj-jhe>

Přednáší: Ing. Jiří KOPAL, Ph.D. (KMA FP TUL)

Abstract: System of linear algebraic equations with a symmetric and positive definite matrix arise from many areas in science and engineering. Although, direct solvers may deliver robust solution, iterative solver based on the conjugate gradient method (CG) is often method of choice. Efficiency of CG strongly depends on preconditioner, i.e., on our ability to approximate the inverse of the system matrix. It can be provided by incomplete algorithms. Well known are the variants of the incomplete Cholesky factorization, on the other hand backward/forward solve steps in every iteration may significantly limit performance of CG. The inverse preconditioners represent a counterpart to the direct ones. Their computation is in general more expensive, on the other hand, especially in parallel environment, their application can be very fast.

We deal with incomplete algorithms based on the Gram-Schmidt orthogonalization with respect to non-standard inner product (induced by the system matrix). Incomplete algorithms employ techniques to preserve sparsity of the computed matrices. We will discuss how to exploit theoretical results to construct such techniques. In addition, numerical aspects will be accompanied by test problems.

Za organizátory :

RNDr. Filip Soudský, Ph.D. a Mgr. Jiří Břehovský, Ph.D.

