ON SOLVING SYMMETRIC INDEFINITE SYSTEMS BY PRECONDITIONED ITERATIVE METHODS

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A problem important both in theory and applications is to efficiently solve systems of linear algebraic equations with large, sparse and symmetric matrices. So far, most of the effort has been devoted to solving systems with saddle-point matrices and there are successful methods for this class of problems. Solving general symmetric indefinite systems seems to be much harder. Many iterative methods do not allow indefinite preconditioners. and straightforward generalizations of the preconditioners from positive definite case often fail. No wonder that direct methods has been considered as methods of choice in many cases in spite of their inherent disadvantages.

The purpose of this work, which is a continuation of the effort presented in (Benzi, Tuma, 2002) is to identify approaches which might lead to reasonably robust and efficient preconditioning of symmetric indefinite matrices. In the talk we will present some strategies for incomplete indefinite decompositions extending those from (Hagemann, Schenk, 2004).

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