Improved Error Bounds for Large Linear Systems

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Abstract

This talk is concerned with a problem of verifying the accuracy of approximate solutions of linear systems. We consider a linear system whose coefficient matrix is an H-matrix. For an arbitrary linear system, this linear system can be achieved using an approximate inverse preconditioning. We proposed error bound using the property of H-matrix in [1]. This error bound has been implemented in the routine verifylss in INTLAB. If a coefficient matrix is large and ill-conditioned, the error bound in [1] is not tight. In this talk, we improve error bound in [1] and propose some error bounds for large linear systems. We show that proposed error bound is better than the error bound in [1]. Computational costs of the proposed error bounds are $O(n^2)$ if a coefficient matrix is an H-matrix. We present some numerical results showing the performance of the proposed error bounds.

References

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