

Accurate computation of the smallest eigenvalue of a diagonally dominant M-matrix

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If each off-diagonal entry and the sum of each row of a diagonally dominant M-matrix are known to certain relative accuracy, it has been proved in a recent work that its smallest eigenvalue and the entries of its inverse are known to the same order relative accuracy independent of any condition numbers. In this talk, we present algorithms that compute these quantities with relative errors in the magnitude of the machine precision. Rounding error analysis and numerical examples are presented to demonstrate the numerical behaviour of the algorithms.

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