

High relative accuracy for some subclasses of totally positive matrices

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SUMMARY

An algorithm can be computed to high relative accuracy (HRA) if it only uses products, quotients, additions of numbers with the same sign or subtractions of initial data (cf. [3]). The construction of algorithms with HRA for some problems in numerical linear algebra (linear system solving, eigenvalue computation, singular value computation and inverse computation) for some subclasses of totally positive (TP) matrices is considered. These algorithms have been constructed only for TP matrices where its bidiagonal factorization, which uses pivots and multipliers of its Neville elimination, can be computed to HRA.

In particular we will recall HRA algorithms for Vandermonde, Bernstein-Vandermonde and q -Bernstein-Vandermonde matrices (cf. [4], [5], [6], [1], [2]).

Keywords: Accurate computations, Bidiagonal decompositions, Totally positive matrices, Bernstein basis, q -Bernstein basis

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