

1067-15-125

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Unitary Equivalence to Matrices with Constant Main Diagonal. Preliminary report.

Two iterative algorithms are developed to transform a given matrix to a unitarily equivalent matrix with constant main diagonal: one if the matrix has elements in \mathbb{R} and one for elements in \mathbb{C} . In both cases, the algorithm will converge in finitely many iterations if the dimension of the matrix is a power of 2. Neither algorithm is globally continuous and for \mathbb{R} a characterization of points of discontinuity is given. For \mathbb{C} , computer experiments reveal suspected points of discontinuity. Then – despite the algorithms’ failure to be globally continuous – it is shown that in special cases there exist paths of matrices along which the algorithm is continuous. The results of further computer experiments are given that indicate such paths may exist in more general cases as well. (Received July 26, 2010)