

Numerical results on noisy blown-up matrices

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Abstract

We study the eigenvalues of large perturbed matrices. We consider an Hermitian pattern matrix P of rank k . In the initial step we have a matrix P , we blow up P to get a large block-matrix B_n , then we generate a random noise W_n . Then we add the random noise to the blown up matrix to obtain the perturbed matrix $A_n = B_n + W_n$. Our aim is to find the eigenvalues of A_n . We prove that under certain conditions A_n has k 'large' eigenvalues which are called structural eigenvalues. We suggest a graphical method to distinguish the structural and the non-structural eigenvalues. Our results generalize some theorems of Bolla [1] and [2].

Keywords: Eigenvalue, symmetric matrix, blown-up matrix, random matrix, perturbation of a matrix.

MSC: AMS classification numbers

References

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