Summary: In this paper, by introducing a class of relaxed filtered Krylov subspaces, we propose the relaxed filtered Krylov subspace method for computing the eigenvalues with the largest real parts and the corresponding eigenvectors of non-symmetric matrices. As by-products, the generalizations of the filtered Krylov subspace method and the Chebyshev-Davidson method for solving non-symmetric eigenvalue problems are also presented. We give the convergence analysis of the complex Chebyshev polynomial, which plays a significant role in the polynomial acceleration technique. In addition, numerical experiments are carried out to show the robustness of the relaxed filtered Krylov subspace method and its great superiority over some state-of-the-art iteration methods.

MSC:
65F15 Numerical computation of eigenvalues and eigenvectors of matrices

Keywords:
eigenvalue estimation; relaxed filtered Krylov subspace; Chebyshev polynomial; non-symmetric matrix

Software:
IRAM; EVSL; lobpcg.m

Full Text: DOI

References:


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