

Some recent progress in generalized Krylov methods

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Abstract

We will discuss recent progress in the development of generalized Krylov methods. In particular, we will discuss the generalized eigenvalue problem

$$A\mathbf{x} = \lambda B\mathbf{x}$$

and the generalized Tikhonov approach

$$(A^*A + \mu B^*B)\mathbf{x} = A^*\mathbf{b}.$$

This talk reflects joint work with Lothar Reichel, Xuebo Yu, and Ian Zwaan. Part of this presentation is based on [2, 1]; see also, e.g., [3, 4, 5].

References

- [1] M. E. HOCHSTENBACH, L. REICHEL AND X. YU, *A Golub–Kahan-type reduction method for matrix pairs*, J. Sci. Comp. 65(2), pp. 767–789, 2015.
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- [3] R.-C. LI AND Q. YE, *A Krylov subspace method for quadratic matrix polynomials with application to constrained least squares problems*, SIAM J. Matrix Anal. Appl. 25, pp. 405–428, 2003.
- [4] L. REICHEL, F. SGALLARI, AND Q. YE, *Tikhonov regularization based on generalized Krylov subspace methods*, Appl. Numer. Math., 62, pp. 1215–1228, 2012.
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