

Efficient approximation of the exponential operator for 2D advection-diffusion problems

Marco Caliari

`mcaliari@math.unipd.it`

Dep. of Pure and Applied Mathematics, University of Padova, Italy

In this work we compare Krylov subspace methods with Faber series expansion for approximating the matrix exponential operator on large, sparse, nonsymmetric matrices. We consider in particular the case of Chebyshev series, corresponding to an initial estimate of the spectrum of the matrix by a suitable ellipse. Experimental results upon matrices with large size, arising from space discretization of 2D advection-diffusion problems, demonstrate that the Chebyshev method can be an effective alternative to Krylov techniques.

References

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