

# Matrix-less methods

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The spectra of Toeplitz-like matrices, for example from PDE or FDE discretizations, are of both theoretical and practical importance. Böttcher et al. described an asymptotic expansion of the approximation errors when sampling the spectral symbol to approximate the spectrum. The so-called “matrix-less” methods have been developed to approximate these expansions, using only a few small matrices, resulting in highly efficient and accurate eigensolvers, for arbitrary order of the matrices of interest. An introduction to the methods will be given, as well as illustrative examples and discussions on current development.

[1] <https://doi.org/10.1080/10586458.2017.1320241>

[2] <https://doi.org/10.1007/s11075-018-0508-0>

[3] <https://arxiv.org/abs/1901.06917>

[4] <https://arxiv.org/abs/1902.08488>

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