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TITLE: Krylov subspace techniques for rational integrators

ABSTRACT:

Implementation of exponential integrators is usually based on Krylov subspace methods, with control of generalized residuals.
We consider the case where rational analogues are used for the matrix exponential and the phi- or related functions, e.g. in Adams-Padé methods. In this case, each step involves solution of linear systems involving certain matrix polynomials, and the corresponding residuals can be readily evaluated by Krylov techniques. We study the question how this can be used to estimate and correct the error of the Krylov approximation.