Error formulas for block rational Krylov approximations of matrix functions

Stefano Massei*[1]

[1]Università di Pisa – Italy

Abstract

We investigate explicit expressions for the error associated with the block rational Krylov approximation of matrix functions. Two formulas are proposed, both derived from characterizations of the block FOM residual. The first formula employs a block generalization of the residual polynomial, while the second leverages the block collinearity of the residuals. A posteriori error bounds based on the knowledge of spectral information of the argument are derived and tested on a set of examples. Notably, both error formulas and their corresponding upper bounds do not require the evaluation of contour integrals.

*Speaker