

Local Linearizations of Rational Matrices with application to Nonlinear Eigenvalue Problems

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Abstract

The numerical solution of nonlinear eigenvalue problems (NLEP) has attracted considerable attention since 2004, mainly as a consequence of the influential reference [5]. A variety of methods have been developed for these problems and the most successful ones can be found in the recent survey [2]. In the large-scale setting the preferred methods consist of three steps [3, 4]: (1) to approximate the NLEP by a rational eigenvalue problem (REP) in a certain region Σ ; (2) to construct a linear eigenvalue problem (LEP) that has the same eigenvalues of the REP in Σ ; (3) to compute via structured rational Krylov methods the eigenvalues of the LEP. The purpose of this talk is to develop a local theory of linearizations of REPs that allows us, among other things, to establish rigorously the properties of the LEPs that have been used in [3, 4] and to extend and simplify the results published recently in [1].

References

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