Contour Integration Method for Nonlinear Eigenvalue Problems

Luka Grubisic
Faculty of Science, University of Zagreb
luka.grubisic@math.hr

Abstract

In this talk we present a method for computing clusters of eigenvalues of nonlinear eigenvalue problems. Our method is based on the contour integration method of Beyn coupled with a reduced basis approximation of the resolvent. In order to allow for adaptive finite element discretizations we frame our method in the Hilbert space setting. Also, we consider eigenvalue problems posed in infinite domain. Our main model problems are wave-guide eigenvalue problems in electromagnetism, and Schroedinger Hamiltonians (possibly non self adjoint) posed in infinite domains. We present numerical experiments and discus this framework's potential to accommodate a more general class of problems.

This is the joint work with J. Gopalakrishnan, J Ovall, R. Schuhman, P. Jorkowski, M. Froidevaux and K. Schmidt.

References

1. J Gopalakrishnan and L Grubišić and J Ovall. Spectral discretization errors in filtered subspace iteration. Mathematics of Computation 89 (321), 203-228, 2020..