

FINITE ELEMENT ANALYSIS OF THE OSEEN EIGENVALUE PROBLEM

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ABSTRACT. The aim of this talk is to present a finite element method for the Oseen eigenvalue problem. This problem is an extension of the Stokes eigenvalue problem, where the presence of the convective term leads to a non-symmetric problem and hence, to complex eigenvalues and eigenfunctions. With the aid of the compact operators theory, we prove that for inf-sup stable finite elements the convergence holds and hence, error estimates for the eigenvalues and eigenfunctions are derived. We also propose an a posteriori error estimator which results to be reliable and efficient. We report a series of numerical tests in two and three dimension in order to assess the performance of the method and the proposed estimator.

Keywords: Oseen equations, Eigenvalue Problems, A posteriori error analysis

Mathematics Subject Classifications (2010): 35Q35, 65N15, 65N25, 65N30, 65N50.

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