

Adaptive finite elements for eigenvalue problems

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We discuss the numerical solution of eigenvalue problems such as arising in hydrodynamic stability theory. The goals are reliability and efficiency of the computation. To this end, a posteriori error estimates are derived for discrete eigenvalues and eigenfunctions. The key to these error estimates is the embedding of the eigenvalue approximation into an abstract framework of Galerkin methods for nonlinear variational problems. The theoretical results are illustrated by several examples.

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