AN HP FINITE ELEMENT METHOD TO SOLVE A FLUID-SOLID VIBRATION PROBLEM

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Abstract. This talk deals with a two-dimensional fluid-solid vibration problem arising from nuclear engineering: the vibration of elastically mounted tubes immersed in a cavity filled with fluid. A convenient variational formulation of this problem, valid for compressible and incompressible fluids, is introduced. An hp finite element method is used for its discretization, which leads to a well posed matrix eigenvalue problem. Optimal order a priori error estimates are proved for eigenfunctions and eigenvalues. Then, local a posteriori error indicators are defined and its efficiency and reliability are studied. An adaptive scheme driven by these indicators is proposed and numerically tested.

[1]Partially supported by ANPCyT (Argentina) under grant PID-2004-23052, e-mail: padra@cab.cnea.gov.ar
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