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ETNA
Kent State University
etna@mcs.kent.edu

A RATIONAL SPECTRAL PROBLEM IN FLUID–SOLID VIBRATION*

HEINRICH VOSS†

Abstract. In this paper we apply a minmax characterization for nonoverdamped nonlinear eigenvalue problems to a rational eigenproblem governing mechanical vibrations of a tube bundle immersed in an inviscid compressible fluid. This eigenproblem is nonstandard in two respects: it depends rationally on the eigenparameter, and it involves non-local boundary conditions. Comparison results are proved comparing the eigenvalues of the rational problem to those of certain linear problems suggesting a way how to construct ansatz vectors for an efficient projection method.

Key words. nonlinear eigenvalue problem, maxmin principle, fluid structure interaction.

AMS subject classification. 49G05.

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† Technical University of Hamburg – Harburg, Section of Mathematics D–20171 Hamburg, Germany. E-mail: voss@tu-harburg.de