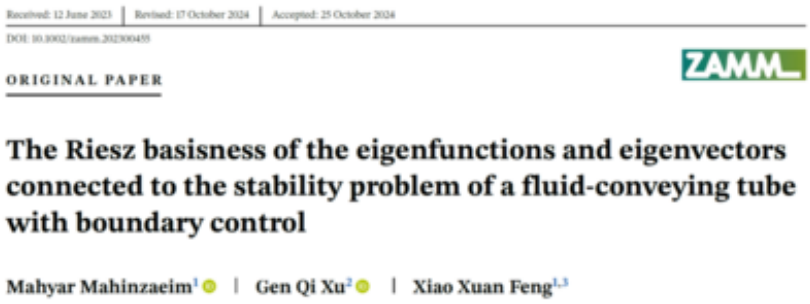
NEWS



NEW PAPER on stability and Riesz basis properties of fluid-conveying tubes

10.01.2025 | Check out our new paper in the journal ZAMM Zeitschrift für Angewandte Mathematik und Mechanik!

The paper studies the stability problem for a stretched tube conveying fluid with boundary control. The abstract spectral problem concerns operator pencils of quadratic and linear forms taking values in different Hilbert product spaces. Thorough analysis is made of the existence, location, multiplicities, and asymptotics of eigenvalues in the complex plane and Riesz basisness of the corresponding eigenfunctions and eigenvectors. Well-posedness of the closed-loop system is established in the framework of semigroups as well as expansions of the solutions in terms of eigenvectors and stability of the closed-loop system. For the parameters of the problem we give new regions, larger than those in the literature, in which a stretched tube with flow, simply supported at one end, with a boundary controller applied at the other end, can be exponentially stabilised.

Read more about the Infinite-Dimensional Systems group here.