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On the spectral behavior of a biharmonic Steklov problem

Abstract

In this talk we consider an eigenvalue problem for the biharmonic operator Δ^2 subject to ‘genuine’ Steklov boundary conditions on a bounded domain in \mathbb{R}^N . First, we show that such boundary value problem can be thought of as a limiting Neumann problem in a phenomenon of mass concentration to the boundary. Then, we address the problem of the dependence of the Steklov eigenvalues upon perturbations of the domain which preserve the Lebesgue measure. We prove that balls are critical domains for all the symmetric functions of all multiple eigenvalues, and moreover, we show that the ball is actually the unique maximizer for the first positive eigenvalue among all Lipschitz domains of fixed measure. We also provide a quantitative version of such isoperimetric inequality which turns out to be sharp.

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