
Shape differentiability of the eigenvalues of the biharmonic operator

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Abstract

In this poster we will present some old and new results concerning the shape differentiability of the eigenvalues of the biharmonic operator subject to different homogeneous boundary conditions. After having recalled the problems under consideration (Dirichlet, Neumann, intermediate and Steklov boundary value problems), we will show that all the elementary symmetric functions of the eigenvalues are real analytic. Then we provide Hadamard-type formulas for all the above mentioned problems. Finally, after having recalled the known results in eigenvalue shape optimization, we will show how to use the Hadamard-type formulas to prove that the ball is a critical domain under volume constraint for any elementary symmetric function of the eigenvalues, and for all the problems considered. Based on joint works with P.D. Lamberti and L. Provenzano.

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