Stability estimates for solutions and eigenfunctions of second-order elliptic Dirichlet BVPs under domain perturbation

Ermal Feleqi

Dipartimento di Matematica

Università degli Studi di Padova

Via Trieste 63, 35121 Padova, Italy

feleqi@math.unipd.it

Abstract

We give estimates for the deviation of solutions and eigenfunctions of second-order uniformly elliptic Dirichlet boundary value problems in suitable Sobolev norms in terms of variations of the domains where these problems are defined. The main estimates are expressed via certain natural and easily computable "atlas" distances between domains with Lipschitz continuous boundaries. As a corollary we derive similar estimates in terms of more "classical" distances such as the Hausdorff distance or the Lebesgue measure of the symmetric difference of domains.

Joint work with Prof. Victor I. Burenkov.

Keywords : domain perturbation, second-order elliptic Dirichlet boundary value problems, stability estimates for solutions and eigenfunctions,