Title:
Elliptic operators with Steklov condition perturbed by Dirichlet condition
on a small part of boundary

Abstract: We consider a boundary value problem for a homogeneous elliptic equation with an inhomogeneous Steklov boundary condition. The problem involves a singular perturbation, which is the Dirichlet condition imposed on a small piece of the boundary. We rewrite such a problem to a resolvent equation for a self-adjoint operator in a fractional Sobolev space on the boundary of the domain. We prove the norm convergence of this operator to a limiting one associated with an unperturbed problem involving no Dirichlet condition. We also establish an order sharp estimate for he convergence rate.The established convergence implies the convergence of the spectra and spectral projectors.
In the second part of the work we study perturbed eigenvalues converging to limiting simple discrete ones. We construct two-terms asymptotic expansions for such eigenvalues and for the associated eigenfunctions.

This is a joint work with D.Borisov, G.A.Chechkin and Yu.O.Koroleva.

Giuseppe Cardone

Università degli Studi di Napoli "Federico II"
Dipartimento di Matematica e Applicazioni " R. Caccioppoli"
Complesso Monte S. Angelo - Via Cintia 80126 Napoli, Italy

email: giuseppe.cardone@unina.it
Homepage: https://www.docenti.unina.it/giuseppe.cardone
Personal homepage: https://sites.google.com/view/giuseppecardone