Elliptic Problems in Smooth and Non Smooth Domains
Chérif Amrouche¹, Mohand Moussaoui², Huy Hoang Nguyen¹,³

SUMMARY

We are interested here in questions related to the regularity of solutions of elliptic problems with Dirichlet or Neumann boundary condition (see ([1])). For the last 30 years, many works have been concerned with questions when Ω is a Lipschitz domain.

We give here some complements for the case of the Laplacian (see [3]), the Bilaplacian ([2], [6]) and the operator div (A∇) (see ([5])), when A is a matrix or a function, and we extend this study to obtain other regularity results for domains having an adequate regularity. We give also new results for the Dirichlet-to-Neumann operator for Laplacian or Bilaplacian.

Using the duality method, we will then revisit the work of Lions-Magenes [4], concerning the so-called very weak solutions, when the data are less regular. Thanks to the interpolation theory, it permits us to extend the classes of solutions and then to obtain new results of regularity.

Keywords: Elliptic problems, Lipschitz domains, regularity, Steklov Poincaré operator.

AMS Classification: 35C15, 35J25, 35J40

References


¹Laboratoire de Mathématiques et Leurs Applications, UMR CNRS 5142, Univ. Pau et Pays de l’Adour, email: cherif.amrouche@univ-pau.fr

²Lab. des EDP Non Linéaires et Histoire des Mathématiques, Ecole Normale Supérieure de Kouba, Alger, email: mmohand47@gmail.com

³Instituto de Matemática and Campus de Xerém, Univ. Federal do Rio de Janeiro, email: nguyen@im.ufrj.br