Seminario de Análisis y Aplicaciones

Viernes, 9 de marzo de 2012

11:30 h., Aula Naranja (ICMat, Campus de Cantoblanco)

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Higher order elliptic boundary value problemes on non-smooth domains

Resumen:

The maximum principle for harmonic functions is one of the fundamental results in the theory of elliptic equations. It holds in arbitrary domains and guarantees that every solution to the Dirichlet problem for the Laplace equation, with bounded data, is bounded.

Analogues of the maximum principle for higher order elliptic operators valid for general domains are unknown, even for the model case of the bilaplacian. The absence of information about the geometry of the domain puts this question beyond the scope of applicability of the previously devised methods, which typically rely on specific assumptions on Ω.

The techniques developed in the present work allow to establish sharp pointwise estimates for derivatives of polyharmonic Green's functions in an arbitrary multi-dimensional domain. These estimates give information on properties of solutions of the polyharmonic Dirichlet problem for "bad" domains.
The Wiener type regularity of a boundary point with respect to a biharmonic equation is discussed.

The results are obtained together with S.Mayboroda (Minnesota).