

SEMINARIO DE ANÁLISIS Y APLICACIONES

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11:30 h., Aula Naranja (ICMAT)

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Functional analytic approach to self-improving properties in PDE

Resumen:

Consider a local solution $u \in W_{loc}^{1,2}$ to an inhomogeneous elliptic partial differential equation in divergence form

$$\operatorname{div}(A\nabla u) = f$$

where A is a uniformly elliptic matrix with measurable coefficient and f is a source term in a suitable L^p space. Classical results in regularity theory tell that when the source term f is slightly better than what is required for the existence of a solution as above, the regularity of the solution itself is also better than what was assumed a priori. This is traditionally seen as a consequence of Gehring's lemma about open-ended property of reverse Hölder classes. In this talk, I discuss a functional analytic point of view on the topic with special focus on extensions to parabolic and fractional PDEs.

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