



DEPARTAMENTO DE
ANÁLISIS MATEMÁTICO Y
MATEMÁTICA APLICADA



SEMINARIO DE ANÁLISIS MATEMÁTICO Y MATEMÁTICA APLICADA

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Two-sided points of Sobolev-extension domains

Abstract: The theory of Sobolev extension domains begins in the sixties with Calderón and Stein works. In the last years there has been an increasing interest in understanding the geometric properties satisfied by those domains U of the euclidean space from where Sobolev functions can be extended to the whole space. For instance Lipschitz and uniform domains are always Sobolev extension domains.

In this talk we are interested in studying the possible size of the set of "self-intersecting" points of the boundary (also called two-sided points) of Sobolev-extension domains, that is, points x belonging to the boundary of U that can be approached from two different sides of U . For $W^{1,p}$ -extension domains with $p \geq n$ this set must be empty because these domains are known to be quasiconvex. However for $1 \leq p < n$ the question becomes more interesting and during the talk we will show some Hausdorff-dimensional estimates for this set of two-sided points. If we have time left over, we will also see an example of a domain U of $\mathbb{R}^3$ which is a $W^{1,p}$ -extension domain for every $p \geq 1$, homeomorphic to the unit ball $B(0,1)$ and so that its boundary has Hausdorff dimension equal to 3. This is a joint work with professor Tapio Rajala and Jyrki Takanen.

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Facultad de CC. Matemáticas, UCM