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On the L^p Hardy inequality

Abstract
Given a domain Ω in $\mathbb{R}^n$ and $p \in]1, \infty[$, we say that the L^p Hardy inequality is satisfied if there exists a constant $c > 0$ such that

$$\int_\Omega |\nabla u|^p dx \geq c \int_\Omega \frac{|u|^p}{\mathrm{dist}^p(x, \partial\Omega)} dx\,, \qquad \text{for all } u \in W_0^{1,p}(\Omega).$$

The best constant c is called L^p Hardy constant and is denoted by $H_p(\Omega)$.

In this talk we present a few stability results, jointly obtained with Gerassimos Barbatis, concerning the dependence of $H_p(\Omega)$ upon variation of p and Ω, with special attention to non-convex domains (in which case the value of $H_p(\Omega)$ is in general not explicitly known).

Time permitting, we shall also present some results obtained with Yehuda Pinchover devoted to the generalization of a few classical results to the case of $C^{1,\alpha}$ domains.