

# Degenerate Poincaré-Sobolev inequalities through Harmonic Analysis

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In this lecture we will discuss some recent results concerning Poincaré and Poincaré-Sobolev inequalities with weights. These results improve some classical estimates due to Fabes-Kenig-Serapioni obtained in the 80's in connection with the local regularity of solutions of appropriate degenerate elliptic equations. We will show that these new general results contain as a byproduct, classical theorems like the John-Nirenberg theorem for BMO functions. Our approach is different from the usual ones and it is based on methods from Harmonic Analysis. We will also discuss other applications of Harmonic Analysis tools to the context of Poincaré inequalities.

This is joint work with E. Rela, University of Buenos Aires.