Poincaré-Sobolev Inequalities and the *p***-Laplacian** Scott Rodney

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Abstract

It is well known that Poincaré-Sobolev inequalities play an important role in applications and in regularity theory for weak solutions of PDEs. In this talk I will discuss two new results connecting matrix weighted Poincaré-Sobolev estimates to the existence of regular weak solutions of Dirichlet and Neumann problems for a degenerate *p*-Laplacian:

$$\Delta_{Q,p}\varphi(x) = \operatorname{Div}\left(\left|Q(x) \nabla\varphi(x)\right|^{p-2} Q(x) \nabla\varphi(x)\right).$$

Degeneracy of $\Delta_{Q,p}$ is given by a measurable non-negative definite matrix-valued function Q(x).