

A priori bounds for elliptic inequalities via regularity estimates

Boyan Sirakov

PUC, Rio de Janeiro

Abstract:

We show how basic estimates from elliptic regularity theory, such as growth lemmas and half-Harnack inequalities, can be used to obtain new and optimal a priori bounds for positive sub- and supersolutions of nonlinear elliptic equations.

We prove new boundary versions of these regularity estimates, which play an important role in the proofs of the a priori bounds, and are of importance in themselves.

We apply the a priori bounds in order to study the existence and multiplicity of solutions of the Dirichlet problem for a general class of elliptic operators in which the first and the second order terms have the same scaling with respect to dilations.