

March 22nd, 2021

Monday's Nonstandard Seminar 25

15:00

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Title: **Gradient estimates for fully nonlinear models with non-homogeneous degeneracy**

Abstract: We establish sharp $C_{\text{loc}}^{1,\beta}$ regularity estimates for bounded solutions of a class of fully nonlinear elliptic PDEs with non-homogeneous degeneracy, whose model equation is given by

$$[|Du|^p + \mathbf{a}(x)|Du|^q] \mathcal{M}_{\lambda,\Lambda}^+(D^2u) = f(x, u) \quad \text{in } \Omega,$$

for a bounded domain $\Omega \subset \mathbb{R}^N$, and suitable data $p, q \in (0, \infty)$, \mathbf{a} and f . Our approach is based on geometric tangential methods and makes use of a refined oscillation mechanism combined with compactness and scaling techniques. Finally, we present some connections of our findings with a variety of nonlinear free boundary problems in the theory of elliptic PDEs, which may have their own interest.