EXISTENCE THEOREMS FOR A CLASS OF QUASILINEAR AND HESSIAN EQUATIONS

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Abstract

We will discuss the existence problem and removability of singulari-
ties for a class of quasilinear and fully nonlinear equations of Monge-
Ampere type with nonlinear source terms. In particular, we will give
necessary and sufficient conditions for the solvability of equations (un-
derstood in the renormalized or viscosity sense) which involve the p-
Laplacian or k-Hessian operator, together with sharp pointwise esti-
mates of solutions. Our approach uses dyadic models, nonlinear trace
inequalities, and other tools of harmonic analysis, along with recent
advances in PDE and potential theory due to Kilpelainen and Maly,
Trudinger and Wang, and Labutin. This work is joint with Nguyen
Cong Phuc.