

COLÓQUIOS 2015
DEPARTAMENTO DE MATEMÁTICA

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FALARÁ SOBRE

Sharp hessian integrability estimates for nonlinear elliptic equations: an asymptotic approach

In this talk we establish sharp $W^{2,p}$ regularity estimates for viscosity solutions of fully nonlinear elliptic equations under minimal, asymptotic assumptions on the governing operator F . By means of geometric tangential methods, we show that if the *recession* of the operator F – formally given by $F^*(M) := \infty^{-1}F(\infty M)$ – is convex, then any viscosity solution to the original equation $F(D^2u) = f(x)$ is locally of class $W^{2,p}$, provided $f \in L^p$, $p > d$, with appropriate universal estimates. Our result extends to operators with variable coefficients and in this setting they are new even under convexity of the frozen coefficient operator, $M \mapsto F(x_0, M)$, as oscillation is measured only at the recession level. The methods further yield BMO regularity of the hessian, provided the source lies in that space. As a final application, we establish the density of $W^{2,p}$ solutions within the class of all continuous viscosity solutions, for generic fully nonlinear operators F . This result gives an alternative tool for treating common issues often faced in the theory of viscosity solutions. This is joint work with E. Teixeira (UFC and ICMC-USP, Brazil).

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16 horas Auditório

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