DIPARTIMENTO DI MATEMATICA - UNIVERSITÀ DI PISA

NEW TRENDS IN PARTIAL DIFFERENTIAL EQUATIONS AND APPLICATIONS

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Boundary regularity for fully nonlinear integro-differential equations

Xavier Ros-Oton(UPC Barcelona)

We study fine boundary regularity properties of solutions to fully nonlinear elliptic integro-differential equations.

First, we show that the class \mathcal{L}_0 of Caffarelli-Silvestre is "too large" for all solutions to elliptic equations to behave comparably near the boundary. Necessary conditions for comparability of all solutions near the boundary lead to the class $\mathcal{L}_* \subset \mathcal{L}_0$, which consists of all the infinitesimal generators of *stable* Lévy processes belonging to \mathcal{L}_0 .

For this class of kernels \mathcal{L}_* we establish fine boundary regularity results, which improve the best known ones even for linear translation invariant equations. Moreover, our estimates remain uniform as the degree of the equation approaches 2.