MEAN VALUE FORMULAS FOR SOLUTIONS OF SOME DEGENERATE ELLIPTIC EQUATIONS AND APPLICATIONS

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ABSTRACT. We prove a mean value formula for weak solutions of $\operatorname{div}(|y|^a \operatorname{grad} u) = 0$ in $\mathbb{R}^{n+1} = \{(x, y) : x \in \mathbb{R}^n, \ y \in \mathbb{R}\}$, $-1 < a < 1$ and balls centered at points of the form $(x, 0)$. We obtain an explicit nonlocal kernel for the mean value formula for solutions of $(-\triangle)^s f = 0$ on a domain D of $\mathbb{R}^n$. When D is Lipschitz we prove a Besov type regularity improvement for the solutions of $(-\triangle)^s f = 0$.