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Juan J Manfredi* (manfredi@pitt.edu), Department of Mathematics, University of Pittsburgh, Pittsburgh, PA 15215. *Regularity for Quasilinear Elliptic Equations in the Heisenberg Group.*

We consider generalizations of the p -Dirichlet integral of the type

$$\int_{\Omega} (\Lambda^2 + |\mathfrak{X}u|^2)^{p/2} dx \tag{1}$$

where $\Lambda \geq 0$, $\Omega \subset \mathbb{R}^N$ is a given domain, and $\mathfrak{X}u = (X_1u, X_2u, \dots, X_ku)$ is the gradient of u relative to a frame of linearly independent vector fields $\mathfrak{X} = \{X_1, X_2, \dots, X_k\}$ in \mathbb{R}^N . In the case of the Heisenberg group \mathcal{H}^n , the horizontal frame \mathfrak{X} consists of $2n$ linearly independent left-invariant horizontal vector fields and $N = 2n + 1$. Estimating the missing derivative is a serious obstacle when trying to extend the classical regularity results to this setting. This is largely an open question.

We will discuss two recent regularity results obtained in collaboration with Giuseppe Mingione and András Domokos, where we are able to prove that $\mathfrak{X}u$ is Hölder continuous for certain range of p not too far from 2.

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