

Second order differentiability of p -harmonic functions in the Heisenberg group

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The talk is based on the joint work with Diego Ricciotti

We will first present an overview of recent progress in regularity results for subelliptic p -harmonic functions by several researchers (Zhong, Ricciotti, Capogna-Citti-Le Donne-Ottazzi). We then establish some new second order differentiability results for p -harmonic functions in the Heisenberg group by adapting a technique originally used by B. Bojarski and T. Iwaniec in the Euclidean case. For example we prove that for $p > 2$ and for $\gamma \geq p$ we have $|\nabla_H u|^\gamma \in HW_{\text{loc}}^{1,2}$ and for $1 < p \leq 2$ we have $\nabla_H^2 u \in L_{\text{loc}}^2$.