

REGULARITY RESULTS FOR WEAK SOLUTIONS TO NONHOMOGENEOUS AND NONLOCAL PROBLEMS

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In this work, we will discuss Hölder regularity for the weak solutions to problems involving the nonlocal double phase operator,

$$\begin{aligned} \mathcal{L}u(x) := & 2 \text{ P.V. } \int_{\mathbb{R}^N} \frac{|u(x) - u(y)|^{p-2}(u(x) - u(y))}{|x - y|^{N+ps_1}} dy \\ & + 2 \text{ P.V. } \int_{\mathbb{R}^N} a(x, y) \frac{|u(x) - u(y)|^{q-2}(u(x) - u(y))}{|x - y|^{N+qs_2}} dy, \end{aligned}$$

where $1 < p \leq q < \infty$, $0 < s_2, s_1 < 1$ and the modulating coefficient $a(\cdot, \cdot)$ is a non-negative bounded function. We will prove the higher (global) Hölder continuity results in the super-quadratic case. We will also discuss the corresponding time dependent problems and some additional results for the constant modulating case.

This is joint work with J. Giacomoni and K. Sreenadh.

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