

# Some properties of the inhomogeneous normalized $p$ -Laplace equation

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The normalized (or game-theoretic)  $p$ -Laplacian

$$\Delta_p^N u := |Du|^{2-p} \Delta_p u = \Delta u + (p-2) \left\langle D^2 u \frac{Du}{|Du|}, \frac{Du}{|Du|} \right\rangle$$

has gained interest during the last 15 years, partly because it is related to two-player *tug-of-war* games. We will focus on the inhomogeneous equation

$$-\Delta_p^N u = f \quad \text{in } \Omega,$$

where  $\Omega \subset \mathbb{R}^n$  is a bounded domain. This equation is uniformly elliptic for  $1 < p < \infty$ , but the normalized  $p$ -Laplacian is gradient dependent and discontinuous. We will mention the known results and open problems related to uniqueness, and go through the proof of local  $C^{1,\alpha}$  regularity of viscosity solutions.

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