TOWARDS A DETERMINISTIC KPZ EQUATION WITH FRACTIONAL DIFFUSION: THE STATIONARY CASE

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ABSTRACT. In this work we analyze the existence of solution to the fractional quasilinear problem,

$$\begin{cases} (-\Delta)^s u &= |\nabla u|^p + \lambda f & \text{in } \Omega, \\ u &= 0 & \text{in } \mathbb{R}^N \setminus \Omega, \\ u &> 0 & \text{in } \Omega, \end{cases}$$

where $\Omega \subset I\!R^N$ is a bounded regular domain ($\mathcal{C}^2$ is sufficient), $s \in (\frac{1}{2}, 1)$, $1 < p$ and f is a measurable nonnegative function with suitable hypotheses.

The analysis is done separately in three cases, subcritical, $1 < p < 2s$, critical, $p = 2s$, and supercritical, $p > 2s$.

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