

**Chen, Huyuan; Felmer, Patricio; Quaas, Alexander**

**Self-generated interior blow-up solutions of fractional elliptic equation with absorption.**

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Summary: In this paper, we study positive solutions to problems involving the fractional Laplacian

$$\begin{cases} (-\Delta)^\alpha u(x) + |u|^{p-1}u(x) = 0, & x \in \Omega \setminus \mathcal{C}, \\ u(x) = 0, & x \in \Omega^c, \\ \lim_{x \in \Omega \setminus \mathcal{C}, x \rightarrow \mathcal{C}} u(x) = +\infty, \end{cases} \quad (0.1)$$

where  $p > 1$  and  $\Omega$  is an open bounded  $C^2$  domain in  $\mathbb{R}^N$ ,  $\mathcal{C} \subset \Omega$  is a compact  $C^2$  manifold with  $N - 1$  multiples dimensions and without boundary, the operator  $(-\Delta)^\alpha$  with  $\alpha \in (0, 1)$  is the fractional Laplacian. We consider the existence of positive solutions for problem (0.1). Moreover, we further analyze uniqueness, asymptotic behavior and nonexistence.

**MSC:**

- [35R11](#) Fractional partial differential equations
- [35B44](#) Blow-up in context of PDEs
- [35B40](#) Asymptotic behavior of solutions to PDEs

**Keywords:**

fractional Laplacian; asymptotic behavior; blow-up; positive solution

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