

Large solutions for a class of semilinear integro-differential equations with censored jumps

JULIO D. ROSSI

University of Buenos Aires, Argentina

We study existence of large solutions, that is, solutions that verify $u(x) \rightarrow +\infty$ as $x \rightarrow \partial\Omega$, for equations like

$$-\mathcal{I}(u, x) + u(x)^p = 0, \quad x \in \Omega,$$

where Ω is a bounded smooth domain in \mathbb{R}^N , $p > 1$ and \mathcal{I} is a nonlocal operator of the form

$$\mathcal{I}(u, x) = \text{P.V.} \int_{|z| \leq \varrho(x)} [u(x+z) - u(x)] |z|^{-(N+\alpha)} dz,$$

where $\alpha \in (0, 2)$ and $\varrho : \bar{\Omega} \rightarrow \mathbb{R}$ is a function whose main particularity is that $0 < \varrho(x) \leq \text{dist}(x, \partial\Omega)$. We also obtain uniqueness of the solution in a class of large solutions whose blow-up rate depends on p, α and the rate at which ϱ shrinks near the boundary.

Joint work with E. Topp (Chile).

REFERENCES

- [1] Andreu-Vaillio, F.; Mazon, J. M.; Rossi, J. D. and Toledo-Melero, J. J. Nonlocal diffusion problems. *Mathematical Surveys and Monographs*, 165. AMS, Providence, RI; 2010.
- [2] Chen, H., Felmer, P. and Quaas, A. *Large Solutions to Elliptic Equations Involving Fractional Laplacian*. Preprint.
- [3] Felmer, P. and Quaas, A. *Boundary Blow-up Solutions for Fractional Elliptic Equations*. *Asymp. Anal.*, (2011), 1–22.