

Boundary strong unique continuation property for fractional elliptic equations

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Abstract

I will present a recent result of strong unique continuation property at boundary points for solutions to the following fractional elliptic equation

$$(-\Delta)^s u = hu$$

in a bounded domain contained in \mathbb{R}^N , $N \geq 2$, $s \in (0, 1)$, under some outer homogeneous Dirichlet boundary condition.

The idea is to consider the Caffarelli-Silvestre extension, thus providing an equivalent formulation of the fractional equation as a local problem in one dimension more. Then, after constructing a procedure of approximation of the domain, in the local context the classical approach developed by Garofalo and Lin allows to derive unique continuation from doubling conditions as a consequence of the boundedness of a suitable Almgren type frequency function.

Combining the aforementioned analysis with blow-up arguments, a strong unique continuation can be achieved in the nonlocal setting.