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Critical negative Schrödinger perturbations of fractional Laplacian

Let $p(t, x, y)$ be the fundamental solution of the equation

$$\partial_t u(t, x) = \Delta^{\alpha/2} u(t, x).$$

I will consider the integral equation

$$\tilde{p}(t, x, y) = p(t, x, y) + \int_0^t \int_{\mathbb{R}^d} p(t-s, x, z) q(z) \tilde{p}(s, z, y) dz ds,$$

where $q(z) = \frac{\kappa}{|z|^\alpha}$ and κ is some constant. The function \tilde{p} solving this equation will be called the Schrödinger perturbations of the function p by q . The case $\kappa > 0$ where recently studied in [1]. First, I will briefly present the main results of this paper. Next, I will focus on the case of negative κ and present the estimates of the function \tilde{p} for all $\kappa \in (-\infty, 0)$.

References

- [1] K. Bogdan, T. Grzywny, T. Jakubowski, and D. Pilarczyk, *Fractional Laplacian with Hardy potential*, preprint (2017).