Nonlinear equations with generalized fractional Laplacian

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Abstract

We study a generalization of the power of Laplace operator with null Dirichlet conditions by means of the spectral theory and prove several existence results for nonlinear equations with such operators. We consider two problems with generalized fractional Laplacian. Firstly, we consider the following equation

$$g(-\Delta)u = f(x, u),$$

where $g(-\Delta)$ is generalized fractional Laplacian. Next, we investigate heat equation with generalized fractional Laplacian

$$u_t + g(-\Delta)u = f(t, x, u).$$