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On sublinear fractional Schrödinger-Poisson systems. (English) Zbl 1479.49014

Summary: We look for solutions to a sublinear fractional Schrödinger-Poisson system

\[ (-\Delta)^s u + V(x)u + K(x)\phi u = f(x, u), \quad x \in \mathbb{R}^3, \]
\[ (-\Delta)^t \phi = K(x)u^2, \quad x \in \mathbb{R}^3, \]

where \((-\Delta)^\alpha\) denotes the fractional Laplacian of order \(\alpha \in (0, 1)\). Applying a new symmetric mountain pass theorem established by Kajikia, we prove the existence of infinitely many solutions for the above equations under certain assumptions on \(V, K\) and \(f\). Some examples are also given to illustrate our main theoretical result.

MSC:
49J35 Existence of solutions for minimax problems
35Q40 PDEs in connection with quantum mechanics
81V10 Electromagnetic interaction; quantum electrodynamics
35R11 Fractional partial differential equations

Keywords:
fractional Schrödinger equations; critical point theory; symmetric mountain pass theorem

Full Text: DOI

References:

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