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Ground state sign-changing solutions and infinitely many solutions for fractional logarithmic Schrödinger equations in bounded domains. (English) [Zbl 07444227](#)

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Summary: We consider a class of fractional logarithmic Schrödinger equation in bounded domains. First, by means of the constraint variational method, quantitative deformation lemma and some new inequalities, the positive ground state solutions and ground state sign-changing solutions are obtained. These inequalities are derived from the special properties of fractional logarithmic equations and are critical for us to obtain our main results. Moreover, we show that the energy of any sign-changing solution is strictly larger than twice the ground state energy. Finally, we obtain that the equation has infinitely many non-trivial solutions. Our result complements the existing ones to fractional Schrödinger problems when the nonlinearity is sign-changing and satisfies neither the monotonicity condition nor Ambrosetti-Rabinowitz condition.

MSC:

[35J20](#) Variational methods for second-order elliptic equations

[35R11](#) Fractional partial differential equations

[35J65](#) Nonlinear boundary value problems for linear elliptic equations

Keywords:

logarithmic Schrödinger equation; fractional Laplacian; sign-changing solutions; non-Nehari method; infinitely many solutions

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