

A potential-free field inverse time-fractional Schrödinger problem: optimal error bound analysis and regularization method

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Abstract

In this paper, an inverse time-fractional Schrödinger problem of potential-free field is studied. This problem is ill-posed, i.e, the solution (if it exists) does not depend continuously on the data. Based on an a priori bound condition, the optimal error bound analysis is given. Moreover, a modified kernel method is introduced. The convergence error estimate obtained by this method under the priori regularization parameter selection rule is optimal, and the convergence error estimate obtained under the posteriori regularization parameter selection rule is order-optimal. Finally, some numerical examples are given to illustrate the effectiveness and stability of this method.

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