A note on nonlocal boundary value problems for parabolic-Schrodinger equations

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Abstract: The nonlocal boundary value problem

$$
\begin{cases}
\dfrac{du(t)}{dt} + Au(t) = f(t) \ (0 \le t \le 1), \\
i\dfrac{du(t)}{dt} + Au(t) = g(t) \ (-1 \le t \le 0) \\
u(-1) = \alpha u(\mu) + \varphi, \ \ 0 \le \mu \le 1,
\end{cases}
\tag{1}
$$

for parabolic-Schrodinger equations in a Hilbert space H, with the self-adjoint positive definite operator A is considered. The stability estimates for the solution of (1) are established. In practice, the stability estimates for solutions of the mixed type boundary value problems for parabolic-Schrodinger equations are obtained. A numerical analysis is given for the parabolic-Schrodinger differential equation. For appoximate solutions of problem (1) the first and second orders of accuracy difference schemes are presented.

Keywords: nonlocal boundary value problem, parabolic-Schrodinger equation, difference scheme, stability.

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