A second order of accuracy finite difference scheme for the integral-differential equation of the hyperbolic type

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Abstract: In this study, the second order of accuracy difference scheme approximately solving the initial-value problem for the integral-differential equation of the hyperbolic type in a Hilbert space H is presented. The stability estimates for the solution of this difference scheme are established. In application, the second order of accuracy difference scheme for solving the local boundary problem for the multidimensional integral-differential equation of the hyperbolic type with two dependent limits is constructed. Theoretical results are supported by numerical examples.

Keywords: finite difference method, integral-differential equation of the hyperbolic type.

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