

High Order of Accuracy Stable Difference Schemes for Numerical

Solutions of NBVP for Hyperbolic Equations

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Abstract

The abstract nonlocal boundary value problem for the hyperbolic equation

$$\begin{cases} u''(t) + Au(t) = f(t), & 0 < t < T, \\ u(0) = \alpha u(1) + \varphi, & u'(0) = \beta u'(1) + \psi \end{cases}$$

in a Hilbert space H with the self -adjoint positive definite operator A is considered. The third and fourth order of accuracy difference schemes for the approximate solutions of this problem are presented. The stability estimates for the solutions of these difference schemes are obtained and numerical results are presented in order to verify theoretical statements.

References

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