

**EXACT AND APPROXIMATE SOLUTIONS OF AN  
ABSTRACT EQUATION OF THE FIRST ORDER OF  
HYPERBOLIC TYPE WITH A NON-CONSTANT  
UNBOUNDED OPERATOR COEFFICIENT IN HILBERT  
SPACE**

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*Abstract*

A problem for the first order abstract hyperbolic equation with a non-constant unbounded operator coefficient in Hilbert space is considered. Exact and approximate solutions are constructed. It is shown that the error estimate for the approximate solution has exponential rate of convergence.

*Key words and phrases:* Hyperbolic type equation; abstract equation; exact and approximate solutions.

*AMS subject classification:* 35L45; 35A35.