

FD-METHOD FOR STURM-LIOUVILLE PROBLEMS.
EXPONENTIAL RATE OF CONVERGENCE

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Abstract

In this work there is considered Sturm-Liouville problem

$$u''(x) + [\lambda - q(x)]u(x) = 0, \quad x \in (0, 1),$$

$$u(0) = u(1) = 0$$

with piecewise smooth coefficient $q(x)$.

The functional-discrete method (FD-method) is used for resolution this problem that was proposed by one of authors.

The aim of this work is to obtain conditions when FD-method has exponential rate of convergence, to obtain explicit estimates of its precision, from which there follow two-sided estimates for exact eigen-values and estimates of remainder terms of classical asymptotic formulas.