

The Woltera integral equation for the solution of inverse problem of the operator with homogenous delay

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This paper observes the Sturm-Liouville type of the operator D^2 generated by the differential expression

$$-y''(x) + q(x)y(\alpha x), \quad q(x) \in L_2[0, \pi], \quad \alpha \in (0, 1),$$

with separate boundary conditions

$$y'(0) - hy(0) = 0, \quad y'(\pi) + H_j y(\pi) = 0, \quad j = 1, 2, h, H_j \in R.$$

The solutions for the set boundary values have been constructed, as well as the characteristic functions of the observed operator. Partial transformations of these functions have been performed. The asymptotics of their zero functions as well as the asymptotics of the eigenvalues of the operator have been established.

Using the method of characteristic functions, the Wolterra integral equation has been constructed which can be used to solve the inverse problem of the operator with homogenous delay.

References

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