

Some properties of eigenvalues and generalized eigenvectors of one boundary-value problem

Hayati OLĞAR¹, O. Sh. MUKHTAROV^{1,2} and Kadriye AYDEMİR³

¹ *Department of Mathematics, Gaziosmanpaşa University, Tokat, Turkey*

E-mail: hayatiolgar@gmail.com

² *Institute of Mathematics and Mechanics, Baku, Azerbaijan*

E-mail: omukhtarov@yahoo.com

³ *Faculty of Education, Giresun University, Giresun, Turkey*

E-mail: kadriyeaydemir@gmail.com

Abstract: We investigate one discontinuous boundary value problem which consist of a Sturm-Liouville equation with piecewise continuous potential together with eigenparameter-dependent boundary conditions and supplementary transmission conditions. We establish some spectral properties of the considered problem. In particular it is shown that the generalized eigenfunctions form a Riesz basis of the adequate Hilbert space.

Keywords: Discontinuous boundary value problem, boundary conditions, Riesz Basis

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REFERENCES

- [1] Aydemir, K., “Boundary value problems with eigenvalue depending boundary and transmission conditions”, *Boundary value problems*, 2014:131, 2014.
- [2] Kerimov, N. B. and Aliev, Z. S. “On the Basis Property of the System of Eigenfunctions of a Spectral Problem with Spectral Parameter in a Boundary Condition”, *Differ. Uravn.*, 43(7), 886-895, 2007.
- [3] Ladyzhenskaia, O. A., “The Boundary Value Problems of Mathematical Physics”, *Springer-Verlag*, New York 1985.
- [4] Mukhtarov, Oktay Sh., Olğar, Hayati and Aydemir, Kadriye, “Resolvent Operator and Spectrum of New Type Boundary Value Problems”, *Filomat*, 29:7, 1671 - 1680, 2015.
- [5] Mukhtarov, O. Sh. and Yakubov, S. “Problems for ordinary differential equations with transmission conditions”, *Appl. Anal.*, Vol 81, 1033-1064, 2002.