FORMULA FOR SECOND REGULARIZED TRACE OF A PROBLEM WITH SPECTRAL PARAMETER DEPENDENT BOUNDARY CONDITION

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Abstract

In the paper we establish a formula for the second regularized trace of
the problem generated by a Sturm – Liouville operator equation and
with a spectral parameter dependent boundary condition.

Keywords: Discrete spectrum, Regularized trace, Trace class.

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1. Introduction

Let $H$ be a separable Hilbert space. In the Hilbert space $L_2 ([0, \pi], H)$ we consider
the following boundary value problem

\begin{align}
- y'' (t) + Ay (t) + q(t) y(t) &= \lambda y(t), \\
y (0) &= 0, \\
y' (\pi) - \lambda y (\pi) &= 0.
\end{align}

Here $A$ is a selfadjoint positive definite operator ($A > E$, $E$ is the identity operator in
$H$) with a compact inverse, $q (t)$ is a selfadjoint operator-valued function in $H$ for each
t. Also let $q (t)$ be weakly measurable with the properties:

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