DETERMINATION OF A LINEAR DIFFERENTIAL EQUATION ON HALF–LINE AND ITS SPECTRAL DISTRIBUTION FUNCTION FROM THE OTHERS RELATED

HERMINIO BLANCARTE

Abstract. Consider two problems with symmetrical boundary value problems and defined by for 
\( j = 1, 2 \) through: 
\[-y'' + q_j(x)y = s^2 y, 0 < x < \infty, y'(0) - k_jy(0) = 0 \]
where \( k_j \in \{h_1, h_2\}, h_1, h_2 \)
are different real numbers, \( s \in \{\lambda(h_1), \mu(h_2)\}, \{\lambda(h_1), \mu(h_2)\} \)
represents the same family of eigenvalues for both problems, \( q_j(x) \) are continuous real valued functions. Their uniqueness is determined through their respective spectral distribution function \( R_j \). The aim of the paper is to relate both previous problems in the following way. We will assume the uniqueness of the first problem and determine the uniqueness of the second problem by linking: both spectral distribution functions \( R_j \), both boundary conditions \( y'(0) - k_jy(0) = 0 \) and both potential \( q_j \).


Keywords and phrases: The Sturm-Liouville boundary value problem on the half-line, isospectral boundary value problems, transfer kernel, the integral Gelfand-Levitan equation, extensions of the estimates \( L_1 - L_\infty \) for the equation of Schrödinger on the half-line.

REFERENCES


