
THE SINGULAR SPECTRAL PROBLEM ASSOCIATED WITH GENERALIZED \mathcal{M} -DERIVATIVE

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ABSTRACT

In this paper, we consider spectral problem with generalized \mathcal{M} -derivative for having Bessel potential function type. Bessel function type problems are significant in the fields of physics. The purpose of this study is to prove a more general version of the representation of the solution to the singular spectral problem using the Bessel potential function type, by including the \mathcal{M} -series. Additionally, the containment of the \mathcal{M} -series in the definition of the generalized \mathcal{M} -derivative enables for more elaborate conclusions to be reached with the acquired data. We employ the Laplace transform to get the representation of the solution to this singular spectral problem. The Laplace transform, in terms of its generalized \mathcal{M} -derivative, is a vigorous method for depth analysis of complex problems. In this singular spectral problem, the substantial results are represented with graphs through the MATLAB program [1-10].

Keywords Singular spectral problem · Generalized \mathcal{M} -derivative · Laplace transform · \mathcal{M} -series

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