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THE INVESTIGATION OF THE COMPLEX SPECTRUM FOR THE ONE STATIONARY PROBLEM WITH TWO-POINT NONLOCAL BOUNDARY CONDITION

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Let us analyze the complex spectrum of the Sturm–Liouville problem with one classical boundary condition

$$-u'' = \lambda u, \qquad t \in (0, 1), \tag{1}$$

$$u(0) = 0, (2)$$

and other nonlocal second type boundary condition

$$u'(1) = \gamma u'(\xi),\tag{3}$$

$$u'(1) = \gamma u(\xi) \tag{4}$$

with the parameters $\gamma \in \mathbb{R}$ and $\xi \in [0, 1]$. The real part of the spectrum is analyzed in [1; 2; 3].

In this study we investigate the behaviour of the complex eigenvalues when $\gamma \in \mathbb{R}$. We prove some properties of critical points in the complex plane. Critical points are important for investigation of multiple eigenvalues. Generalized eigenfunctions can exist for these points. We will present the modeling results.

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