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On the Spectral Properties of the Regular Sturm-Liouville Problem with the Lag Argument for
Which its Boundary Conditions Depends on the Spectral Parameter

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Abstract: In this paper, the asymptotic expression of the eigenvalues and eigenfunctions of the Sturm-Liouville equation with the lag argument $y''(t) + \bullet^2 y(t) + M(t)y(t - \Delta(t)) = 0$ and the spectral parameter in the boundary conditions $\bullet y(0) + y'(0) = 0$, $\bullet^2 y(\pi) + y'(\pi) = 0$, $y(t - \Delta(t)) = y(0)\varphi(t - \Delta(t))$, $t - \Delta(t) < 0$ has been founded in a finite interval, where $M(t)$ and $\Delta(t) \geq 0$ are continuous functions on $[0, \pi]$, $\bullet > 0$ is a real parameter, $\varphi(t)$ is an initial function which is satisfied with the condition $\varphi(0) = 1$ and continuous in the initial set.

Key Words: Lag argument, Eigenvalue, Eigenfunction, Asymptotic expression.

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