

Spectral Problems for Non-Linear Sturm-Liouville Equations with Eigenparameter Dependent Boundary Conditions

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Abstract. The nonlinear Sturm-Liouville equation

$$-(py')' + qy = \lambda(1 - f)ry \text{ on } [0, 1]$$

is considered subject to the boundary conditions

$$(a_j\lambda + b_j)y(j) = (c_j\lambda + d_j)(py')(j), \quad j = 0, 1.$$

Here $a_0 = 0 = c_0$ and $p, r > 0$ and q are functions depending on the independent variable x alone, while f depends on x, y and y' . Results are given on existence and location of sets of (λ, y) bifurcating from the linearized eigenvalues, and for which y has prescribed oscillation count, and on completeness of the y in an appropriate sense.

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