

# Positive Solutions for a Derivative Dependent $p$ -Laplacian Equation with Riemann-Stieltjes Integral Boundary Conditions

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## Abstract

In this talk, we will discuss the existence of two non-trivial positive solutions to a class of boundary value problems (BVP), involving a  $p$ -Laplacian, of the form:

$$\begin{aligned}(\Phi_p(x'))' + g(t)f(t, x, x') &= 0, \quad t \in (0, 1), \\ x(0) - ax'(0) &= \alpha[x], \\ x(1) + bx'(1) &= \beta[x],\end{aligned}$$

where  $\Phi_p(x) = |x|^{p-2}x$  is a one dimensional  $p$ -Laplacian operator with  $p > 1$ ,  $a, b$  are real constants. Here  $\alpha, \beta$  are given by Riemann-Stieltjes integrals

$$\alpha[x] = \int_0^1 x(t)dA(t), \quad \beta[x] = \int_0^1 x(t)dB(t),$$

where  $A$  and  $B$  are functions of bounded variations. We will use the fixed point index theory to establish our results.

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<sup>1</sup>Joint work with S. Padhi