

**Title:** On the sign-changing solutions for strong singular one-dimensional  $p$ -Laplacian problems with  $p$ -superlinearity

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We consider the one-dimensional  $p$ -Laplacian problem

$$\begin{cases} (\varphi_p(u'(t)))' + h(t)f(u(t)) = 0, & \text{a.e. in } (0, 1), \\ u(0) = u(1) = 0, \end{cases} \quad (P)$$

where  $\varphi_p(s) = |s|^{p-2}s$ ,  $p > 1$ ,  $h(t) \geq 0$  and  $0 < \int_I h(t)dt < \infty$  for any compact subinterval  $I \subset (0, 1)$ , and  $f \in C(\mathbb{R}, \mathbb{R})$  with  $f$   $p$ -superlinear at  $\infty$ . By applying the global bifurcation argument and nonlinear eigenvalue theory, we establish an existence and multiplicity result of sign-changing solutions for  $(P)$ . Our result generalizes and improves some recent result from the case  $h \in L^1(0, 1)$  to a strong singular case  $h \in \mathcal{A} \triangleq \{h \in L^1_{loc}(0, 1) : \int_0^1 (s(1-s))^{p-1} h(s)ds < \infty\}$ .

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