

BIFURCATION FOR THE p -LAPLACIAN IN \mathbb{R}^{N^*}

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1. Introduction. In this work we look for positive (weak) solutions of the following problems

$$-\Delta_p u(x) + \alpha u^{p-1}(x) = \lambda h(x)u^{q-1}(x) + g(x)u^{r-1}(x), \quad x \in \mathbb{R}^N, \quad (P_\lambda)$$

with $1 < p < \infty$, $1 < q < p < r < p^*$, where

$$p^* := \begin{cases} \frac{Np}{N-p}, & 1 < p < N, \\ \infty, & p \geq N, \end{cases}$$

λ is a real parameter, $\alpha \geq 0$, h and g verify some integrability conditions. When $p = 2$ the problem corresponds to the classical *Laplacian* and also in this case the results are new. We will study three different cases:

- (I) The case where $\alpha = 1$, $h \in L^s(\mathbb{R}^N)$, for all $s \in (1, \infty]$, and $g \in L^t(\mathbb{R}^N)$, where t is an exponent that will be made precise later. We look for solutions $u \in W^{1,p}(\mathbb{R}^N)$.

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