

# On branches of positive solutions to p-Laplacian problems at the extreme value of Nehari manifold method

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**Abstract.** This work concerns the application of the Nehari manifold method to the study of branches of positive solutions to the problem

$$-\Delta_p u = \lambda |u|^{p-2} u + f |u|^{\gamma-2} u, \quad u \in W_0^{1,p}(\Omega),$$

where  $\Delta_p$  is the p-Laplacian operator,  $f$  changes signs,  $\lambda$  is a real parameter and  $1 < p < \gamma < p^*$ . A special care is given to the extreme value  $\lambda^*$ , which is characterized variationally by

$$\lambda^* = \inf \left\{ \frac{\int |\nabla u|^p}{\int |u|^p}, \quad u \in W_0^{1,p}(\Omega), \quad \int f |u|^\gamma \geq 0 \right\}.$$

The main result deals with the existence of two positive solutions when  $\lambda \in (\lambda_1, \lambda^* + \varepsilon)$ .

Joint work with Yavdat Il'yasov (UFA-Russia)

## References

- [1] IL'YASOV, YAVDAT AND SILVA, KAYE. On branches of positive solutions for p-Laplacian problems at the extreme value of Nehari manifold method, To Appear in Proceedings of the American Mathematical Society.