Eigenvalue problem for the p-Laplacian: results and problems

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SUMMARY

In this talk we discuss the nonlinear homogeneous eigenvalue problem for the p-Laplacian with $1 < p < \infty$. We focus on different variational characterizations of the eigenvalues as well as on the properties of the eigenfunctions. We also discuss solvability of perturbed problems. Namely, we mention Landesman-Lazer type results for the p-Laplacian and present different points of view of the Fredholm alternative at the first eigenvalue: variational and bifurcation approaches. The results presented in this talk were obtained with the speaker and his coauthors Paul Binding, Jan Čepička, Lyonell Boulton, Manuel DelPino, Petr Girg, Gabriela Holubová, Yin Xi Huang, Raul Manasevich, Stephen Robinson, Peter Takáč and Michael Ulm during the last two decades. Besides these results we address also some open problems which are left in this field.

Keywords: p-Laplacian, eigenvalue problem, Fredholm alternative

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