# A MULTIPLICITY RESULT FOR A
# DOUBLE EIGENVALUE P-LAPLACIAN EQUATION
# ON UNBOUNDED DOMAIN

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**Abstract.** We present a multiplicity result concerning a class of quasilinear eigenvalue problems with nonlinear boundary conditions on unbounded domain. The proofs are based on the Mountain Pass theorem applied to weighted Sobolev spaces. Our paper completes the results obtained in this direction (see for instance [1], [3], [5], [6], [8]).

**MSC 2000.** 35P30, 35J20, 35J65, 35J70, 58E05.

**Key words.** p-Laplacian, quasilinear elliptic equation, eigenvalue problems, unbounded domain, weighted function space.

## REFERENCES

[1] CÂRSTEA, F.-C. ŞT. and RĂDULESCU, V., *On a class of quasilinear eigenvalue problems on unbounded domains*, Arch. der Math., **77** (2001), 337–346.

[2] DIAZ, J. I., *Nonlinear partial differential equations and free boundaries. Elliptic equations.* Pitman Adv. Publ., Boston , 1986.

[3] LISEI, H., VARGA, CS. and HORVÁTH, A., *Multiplicity results for a class of quasilinear eigenvalue problems on unbounded domains*, Arch. der Math., in press

[4] DE NÁPOLI, P. and MARIANI, M. C., *Equations of p-Laplacian Type in Unbounded Domains* Adv. Nonlinear Studies **2** (2001), 237–250

[5] MEZEI, I. I. and VARGA, CS., *Multiplicity result for a double eigenvalue quasilinear problem on unbounded domain*, Nonlinear Analysis, in press

[6] PFLÜGER, K., *Existence and multiplicity of solutions to a p-Laplacian equation with nonlinear boundary condition*, Electronic J.Differential Equations **10** (1998), 1–13.

[7] PFLÜGER, K., *Compact traces in weighted Sobolev space.* Analysis **18** (1998), 65–83.

[8] MONTEFUSCO, E. and RADULESCU, V., *Nonlinear eigenvalue problems for quasilinear operators on unbounded domains*, Nonlinear differ. equ. appl. **8** (2001) 481-497

[9] RABINOWITZ, P. H., *Minimax Method in Critical Point Theory with Applications to Differential Equations*, CBMS Regional Conf. Series in Math. **65**, AMS, Providence (1986)

[10] WILLEM, M., *Minimax theorems*, Birkhäuser, Boston, 1996

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