

THE (p, q) -ELLIPTIC SYSTEMS WITH CONCAVE-CONVEX NONLINEARITIES

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Abstract. Multiple positive solutions for the (p, q) -elliptic systems with the concave-convex nonlinearities are obtained by using the Nehari manifold and the fibering method.

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REFERENCES

- [1] K. ADRIOUCH AND A. EL HAMIDI, *The Nehari manifold for systems of nonlinear elliptic equations*, Nonlinear. Analysis **64** (2006), 2149–2167.
- [2] G. A. AFROUZI, S. MAHDAVI AND Z. NAGHIZADEH, *The Nehari manifold for p -Laplacian equation with Dirichlet boundary condition*, Nonlinear Anal: Modelling and Control **12** (2007), 143–155.
- [3] A. AGHAJANI AND J. SHAMSHIRI, *Multiplicity of positive solutions for quasilinear elliptic p -laplacian systems*, Electron. J. Differential Equations **111** (2012), 1–16.
- [4] Y. BOZHKOV AND E. MITIDIERI, *Existence of multiple solutions for quasilinear systems via fibering method*, J. Differential Equations **190** (2003), 239–267.
- [5] K. J. BROWN AND T-F. WU, *A fibering map approach to a semilinear elliptic boundary value problem*, Electron. J. Differential Equations **69** (2007), 1–9.
- [6] H. N. FAN, *Multiple positive solutions for semi-linear elliptic systems with sign-changing weight*, J. Math. Anal. Appl. **409** (2014), 399–408.
- [7] S. I. POHOZAEV, *On fibering method for the solutions of nonlinear boundary value problems*, Trudy Mat. Inst. Steklov **192** (1990), 146–163.
- [8] H. RAMOS QUOIRIN, *Lack of coercivity in a concave-convex type equation*, Calc. Var. Partial Differential Equations **37** (2010), 523–546.
- [9] S. H. RASOULI AND G. A. AFROUZI, *The Nehari manifold for a class of concave-convex elliptic systems involving the p -Laplacian and nonlinear boundary condition*, Nonlinear Anal **73** (2010), 3390–3401.
- [10] J. VÉLIN, *On an existence result for a class of (p, q) -gradient elliptic systems via a fibering method*, Nonlinear Anal. **75** (2012), 6009–6033.
- [11] G. Y. YANG AND M. X. WANG, *Existence of multiple positive solutions for a p -Laplacian system with sign-changing weight functions*, Computers and Mathematics with Applications, **55** (2008), 636–653.
- [12] G. Q. ZHANG, X. P. LIU AND S. Y. LIU, *Remarks on a class of quasilinear elliptic systems involving the (p, q) -Laplacian*, Electron. J. Differential Equations, **20** (2005), 1–10.