

# Selected References on the $p$ -Laplacian and related topics in quasilinear elliptic PDE

Yuanji Cheng, Juan J. Manfredi

May 10, 2005

## Books & lecture notes

1. H. Aikawa, M Essén, Akawa, Potential theory selected topics, *Lecture notes in Math.* 1633, *Springer-Verlag*, 1996
2. E. DiBenedetto, Degenerate parabolic equations. *Springer-Verlag*, New York, 1993
3. P. Drábek, A. Kufner, F. Nicolosi, Quasilinear elliptic equations with degenerations and singularities, *Walter de Gruyter, Berlin*. 1997
4. Giaquinta, Mariano Multiple integrals in the calculus of variations and nonlinear elliptic systems. *Annals of Mathematics Studies*, 105. *Princeton University Press, Princeton, NJ*, 1983.
5. E. Giusti, Direct methods in the calculus of variations, *World Scientific Publishing Co., Inc., River Edge, NJ*, 2003.
6. J. Heinonen, T. Kilpeläinen, O. Martio, Nonlinear potential theory of degenerate elliptic equations. *Oxford Univ. Press, Oxford*, 1993.
7. Ladyzhenskaya, O. A.; Uraltseva, N. N. Lineĭnye i kvazilineĭnye uravneniya lipticheskogo tipa. (Russian) [Linear and quasilinear equations of elliptic type] *Second edition, revised. Izdat. "Nauka", Moscow, 1973.* 576 pp.
8. Ireneo Peral, Multiplicity of solutions for the  $p$ -Laplacian. *Int. center for theoretical physics, Trieste, 1997*
9. The  $p$ -Harmonic Equation and Recent Advances in Analysis - *Contemporary Mathematics* 370, Ed. Pietro Poggi-Corradini, Kansas State University, Editor - AMS, 2005
10. M. Struwe, Variational methods with applications, Sec. Ed. *Springer-Verlag, New York*, 1993

## Papers

### From 2000 on

1. W. Allegretto, Sturm theorems for degenerate elliptic equations. *Proc. Amer. Math. Soc.* 129:10 (2001), 3031–3035.
2. A. Anane, N Tsouli, On a resonance condition between the first and the second eigenvalues for the  $p$ -Laplacian, *Int. J. Math. Sci.*, 26:10 (2001) 625 - 634.
3. Aronsson, Gunnar; Crandall, Michael G.; Juutinen, Petri A tour of the theory of absolutely minimizing functions. *Bull. Amer. Math. Soc. (N.S.)* 41 (2004), no. 4, 439–505.
4. C. Azizieh, P. Clément, E. Mitidieri, Existence and a priori estimates for positive solutions of  $p$ -Laplace systems. *J. Diff. Equa.* 184:2 (2002) 422–442.
5. V. Benci, A. M. Micheletti and D. Visetti, An Eigenvalue Problem for a Quasilinear Elliptic Field Equation, *J. Diff. Equa.* 184:2(2002) 299-320
6. G. Bognár, P. Drábek, The  $p$ -Laplacian equation with superlinear and supercritical growth, multiplicity of radial solutions. *Nonlinear Anal.* 60:4 (2005) 719–728.
7. T. Bhattacharya, On the properties of  $\infty$ -harmonic functions and an application to capacity rings. *Electron. J. Diff. Equ.* 101 (2002)
8. H. Brezis, Y. Li, Topology and Sobolev spaces. *J. Funct. Anal.* 183:2 (2001) 321–369.
9. P. Clément, J. Fleckinger, E. Mitidieri, F. de Thelin, Existence of positive solutions for a nonvariational quasilinear elliptic system. *J. Diff. Equa.* 166:2 (2000) 455–477.
10. M. Cuesta, D. G: de Figueiredo, J. P. Gossez, A nodal domain property for the  $p$ -Laplacian. *C. R. Acad. Sci. I - Math.* 330:8 (2000) 669-673.
11. L. Damascelli, F. Pacella, Monotonicity and symmetry results for  $p$ -Laplace equations And applications, *Adv. Diff. Equa.* 5 (2000) 1179 – 1200. ,  $1 < p < 2$ , Via the moving plane method.
12. P. Drábek, P. Girg, P. Tak\*č, M. Ulm, The Fredholm alternative for the  $p$ -Laplacian: bifurcation from infinity, existence and multiplicity. *Indiana Univ. Math. J.* 53:2 (2004) 433–482.
13. Y. Du, and Z. Guo, Liouville type results and eventual flatness of positive solutions for  $p$ -Laplace equations. *Adv. Diff. Equa.* 7 (2002) 1479 - 1512.
14. M. Garcia-Huidobro, R. Manasevich, J. Serrin, M. Tang, C. Yarur, Ground states and free boundary problems for the n-Laplacian in n-dimensional space . *J. Func. Anal.* , 172 (2000) 177-201.
15. M. Garcia-Huidobro, R. Manásevich, P. Yan, M. Zhang, A  $p$ -Laplacian problem with a multi-point boundary condition. *Nonlinear Anal.* 59:4 (2004) 319–333.
16. Z. Guo, J. R. L. Webb, Structure of boundary blow-up solutions for quasi-linear elliptic problems. II. Small and intermediate solutions. *J. Diff. Equa.* 211:1 (2005) 187–217.

17. Z. Guo and J. R. L. Webb, Spike-Layer solutions for quasilinear elliptic equations. *Comm. Contemp. Math.* 5:6 (2003) 883–920.
18. I. E. Hadi, N. Tsouli, Strong unique continuation of the eigenfunctions for the  $p$ -Laplacian operator, *Int. J. Math. Math. Sci.* 25:3 (2001) 213–216.
19. F. Hang, F. Lin, Topology of Sobolev mappings. *Math Res. Lett.* 8:3 (2001) 321–330
20. F. Hang, F. Lin, Topology of Sobolev mappings. II. *Acta Math.* 191:1 (2003) 55–107.
21. F. Hang, F. Lin, Topology of Sobolev mappings. III. *Comm. Pure Appl. Math.* 56:10 (2003) 1383–1415.
22. Juutinen, Petri; Lindqvist, Peter, A theorem of Radó's type for the solutions of a quasi-linear equation. *Math. Res. Lett.* 11 (2004), no. 1, 31–34.
23. Juutinen, Petri; Lindqvist, Peter; Manfredi, Juan J., On the equivalence of viscosity solutions and weak solutions for a quasi-linear equation. *SIAM J. Math. Anal.* 33 (2001), no. 3, 699–717
24. Juutinen, Petri; Lindqvist, Peter; Manfredi, Juan J., The infinity Laplacian: examples and observations. *Papers on analysis, 207–217, Rep. Univ. Jyväskylä Dep. Math. Stat.*, 83, Univ. Jyväskylä, Jyväskylä, 2001.
25. Lindqvist, Peter; Manfredi, Juan; Saksman, Eero, Superharmonicity of nonlinear ground states. *Rev. Mat. Iberoamericana* 16 (2000), no. 1, 17–28.
26. R. Manásevich, J. Mawhin, The spectrum of  $p$ -Laplacian systems under Dirichlet, Neumann and periodic boundary conditions. *Morse theory, minimax theory and their applications to nonlinear differential equations, 201–216, New Stud. Adv. Math.*, 1, Int. Press, Somerville, MA, 2003.
27. R. Manásevich, G. Sweers, A comparison result for perturbed radial  $p$ -Laplacians. *J. Math. Anal. Appl.* 291:1 (2004) 1–19.
28. P. Pucci, J. Serrin, The strong maximum principle revisited. *J. Diff. Equa.* 196:1 (2004), 1–66.
29. J. Serrin, H. Zou, Cauchy-Liouville and universal boundedness theorems for quasilinear elliptic equations and inequalities. *Acta Math.* 189:1 (2002) 79–142.
30. P. Takač, On the Fredholm alternative for the  $p$ -Laplacian at the first eigenvalue. *Indiana Univ. Math. J.* 51:1 (2002) 187–237.

## 1990–1999

1. Acerbi, E.; Fusco, N. Local regularity for minimizers of nonconvex integrals., *Ann. Scuola Norm. Sup. Pisa Cl. Sci. (4)* 16 (1989), no. 4, 603–636 (1990)
2. W. Allegretto, Y. X. Huang, Principal eigenvalues and Sturm comparison via Picone's identity. *J. Diff. Equa.* 156:2 (1999) 427–438.

3. Alvarez, O. Lasry, J.-M.; Lions, P.-L., Convex viscosity solutions and state constraints. *J. Math. Pures Appl.* (9) 76 (1997), no. 3, 265–288.
4. A. Ambrosetti, J. Garcia Azorero, I. Peral Alonso, Multiplicity results for some nonlinear elliptic equations, *J. Func. Anal.* 137 ( 1996) 219-242.
5. A. Anane, N Tsouli, On the second eigenvalue of the  $p$ -Laplacian, *Pitman Research Notes in Math.* 343 (1996) 1-9.
6. G. Aronsson, On  $p$ -harmonic functions, convex duality and an asymptotic formula for injection mould filling. *Euro. J of Appl. Math.* 7 ( 1996 ) 417 - 437
7. P. A. Binding, Y. X. Huang, Existence and nonexistence of positive eigenfunctions for the  $p$ -laplacian, *Proc. Amer. Math. Soci.* 123:6 (1995) 1383- 1388
8. Y. Cheng, An eigenvalue problem for quasilinear elliptic equations, *Math. Nachr.* 196 (1998) pp.43-59
9. Y. Cheng, On the positive solutions of a quasilinear elliptic system, *Czech. Math. J.* 47:4 (1997) pp.681-687
10. Y. Cheng, Hölder continuity of the inverse of p-Laplacian, *J. Math. Anal. Appl.* 221:2 (1998) pp.734-748
11. Crandall, Michael G.; Ishii, Hitoshi, The maximum principle for semicontinuous functions. *Differential Integral Equations* 3 (1990), no. 6, 1001–1014.
12. L. Damascelli, F. Pacella, Monotonicity and symmetry results for  $p$ -Laplace equations ,  $1 < p < 2$ , via the moving plane method. *Ann. Scuola Norm. Sup. Pisa CL. Sci. IV Ser.* 26 (1998) 689 707.
13. DiBenedetto, E.; Manfredi, J. On the higher integrability of the gradient of weak solutions of certain degenerate elliptic systems. *Amer. J. Math.* 115 (1993), no. 5, 1107–1134.
14. J. Fleckinger, E. M. Harrel II, F. de Thelin, Boundary behavior and estimates for solutions of equations containing the  $p$ -Laplacian. *Electronic J of Diff. Equ.* 38 ( 1999) 1 - 19.
15. Fukagai, Nobuyoshi; Ito, Masayuki; Narukawa, Kimiaki, Limit as  $p \rightarrow \infty$  of  $p$ -Laplace eigenvalue problems and  $L^\infty$ -inequality of the Poincaré type. *Differential Integral Equations* 12 (1999), no. 2, 183–206.
16. J. Garcia Azorero, I. Peral Alonso, Some results about the existence of a second positive solution in a quasilinear critical problem, *Indiana Univ math. J.* 43:3 (1994) 941-957
17. J. Garcia Azorero, I. Peral Alonso, Multiplicty of solutions for elliptic problem with critical exponent or with a nonsymmetric term. *Trans. Amer. Math. Soci.* 323:2 (1991) 877-895.
18. Greco, L., Iwaniec,T. and Sbordone, C., Inverting the  $p$ -harmonic operator. *Manuscripta Math.* 92 (1997), no. 2, 249–258
19. Iwaniec, Tadeusz,  $p$ -harmonic tensors and quasiregular mappings. *Ann. of Math.* (2) 136 (1992), no. 3, 589–624.

20. P. Lindqvist, On the equation  $\nabla(|\nabla u|^{p-2}\nabla u) + \lambda|u|^{p-2}u = 0$ . *Proc. Amer. Math. Soci.* 109 (1990) 157 -164.
21. Jensen, Robert, Uniqueness of Lipschitz extensions: minimizing the sup norm of the gradient. *Arch. Rational Mech. Anal.* 123 (1993), no. 1, 51-74.
22. Juutinen, Petri; Lindqvist, Peter; Manfredi, Juan J. The  $\infty$ -eigenvalue problem. *Arch. Ration. Mech. Anal.* 148 (1999), no. 2, 89-105
23. Kilpelinen, Tero, A Rad type theorem for  $p$ -harmonic functions in the plane. *Electron. J. Differential Equations* 1994, No. 09, approx. 4 pp. (electronic).
24. Manfredi, Juan J. Isolated singularities of  $p$ -harmonic functions in the plane. *SIAM J. Math. Anal.* 22 (1991), no. 2, 424-439.
25. J. Serrin, H. Zou, Symmetry of ground states of quasilinear elliptic equations. *Arch. Ration. Mech. Anal.* 148:4 (1999) 265-290.

## Until 1989

1. Acerbi, E.; Fusco, N., Regularity for minimizers of nonquadratic functionals: the case  $1 < p < 2$ . *J. Math. Anal. Appl.* 140 (1989), no. 1, 115-135.
2. Aronsson, Gunnar Extension of functions satisfying Lipschitz conditions. *Ark. Mat.* 6 1967 551-561 (1967).
3. Aronsson, Gunnar Representation of a  $p$ -harmonic function near a critical point in the plane. *Manuscripta Math.* 66 (1989), no. 1, 73-95.
4. T. Bhattacharya, Radial symmetry of the first eigenfunction for the  $p$ -Laplacian in the ball. *Proc. Amer. Math. Soc.* 104:1 (1988) 169-174.
5. M. Del Pino, M. Elgueta, R. Manasevich, A homotopic deformation along  $p$  of a Leray-Schauder degree result and existence for  $(|u'|^{p-2}u')' + f(t, u) = 0, u(0) = u(T) = 0, p > 1$ . *J. Diff. Equa.* 80 (1989) 1-13.
6. E. Di Benedetto,  $C^{1,\alpha}$  local regularity of weak solutions of degenerate elliptic equations. *Nonlinear analysis*, 7:8 (1983) 827 -850.
7. H. Egnell , Existence and nonexistence for the  $m$ -laplace equations involving critical Sobolev exponents. *Arch. Rational Mech. Anal.* 104 (1988) 57 - 77.
8. J. Garcia Azorero, I. Peral Alonso, Existence and nonexistence for the  $p$ -laplacian: Nonlinear eigenvalues. *Comm. Partial Diff. Equa.* 12 (1987) 1389 - 1430
9. Iwaniec, T., Projections onto gradient fields and  $L^p$ -estimates for degenerated elliptic operators. *Studia Math.* 75 (1983), no. 3, 293-312.
10. Iwaniec, Tadeusz; Manfredi, Juan J., Regularity of  $p$ -harmonic functions on the plane. *Rev. Mat. Iberoamericana* 5 (1989), no. 1-2, 1-19.

11. Jensen, Robert, Uniqueness criteria for viscosity solutions of fully nonlinear elliptic partial differential equations. *Indiana Univ. Math. J.* 38 (1989), no. 3, 629–667.
12. Kràl, J. Some extension results concerning harmonic functions. *J. London Math. Soc. (2)* 28 (1983), no. 1, 62–70.
13. J. L. Lewis, Regularity of the derivatives of solutions to certain degenerate elliptic equations, *Indiana Univ. Math. J* 32 (1983) 849-858.
14. G. Lieberman, Boundary regularity for solutions of degenerate elliptic equations. *Nonlinear analysis*, 12:11 (1988) 1203 -1219.
15. Lindqvist, Peter, On the definition and properties of  $p$ -superharmonic functions. *J. Reine Angew. Math.* 365 (1986), 67–79.
16. Manfredi, Juan J.  $p$ -harmonic functions in the plane. *Proc. Amer. Math. Soc.* 103 (1988), no. 2, 473–479.
17. S. Sakaguchi, Concavity properties of solutions to some degenerate quasilinear elliptic Dirichlet problems. *Ann. Scuola Norm. Sup. Pisa* 14:3 (1987) 403–421.
18. Manfredi, Juan J.; Weitsman, Allen On the Fatou theorem for  $p$ -harmonic functions. *Comm. Partial Differential Equations* 13 (1988), no. 6, 651–668.
19. P. Tolksdorf, Regularity for a more general class of quasilinear elliptic equations. *J. Diff. Equa.*, 51 (1984) 126 - 150.
20. Uhlenbeck, K., Regularity for a class of non-linear elliptic systems. *Acta Math.* 138 (1977), no. 3-4, 219–240.