EXISTENCE OF SOLUTIONS FOR SOME NONCOERCIVE ELLIPTIC PROBLEMS INVOLVING DERIVATIVES OF NONLINEAR TERMS

Lucio Boccardo, Gisella Croce and Luigi Orsina

Abstract. We study a nonlinear equation with an elliptic operator having degenerate coercivity. We prove the existence of a $W_0^{1,1}(\Omega)$ solution which is distributional or entropic, according to the growth assumptions on a lower order term in divergence form.

REFERENCES

[1] Ph. Bénilan, L. Boccardo, T. Gallouët, R. Gariepy, M. Pierre and J.L. Vázquez, *An L^1-theory of existence and uniqueness of solutions of nonlinear elliptic equations*, Ann. Scuola Norm. Sup. Pisa Cl. Sci., **4** (1995), 241–273.

[2] L. Boccardo, *Some nonlinear Dirichlet problems in L^1 involving lower order terms in divergence form*, Progress in elliptic and parabolic partial differential equations (Capri, 1994), 43–57, Pitman Res. Notes Math. Ser., 350, Longman, Harlow, 1996.

[3] L. Boccardo, H. Brezis, it Some remarks on a class of elliptic equations, Boll. Unione Mat. Ital., **6** (2003), 521–530.

[4] L. Boccardo, G. Croce, L. Orsina, *Nonlinear degenerate elliptic problems with $W_0^{1,1}$ solutions*, to appear in *Manuscripta Math.*.

[5] L. Boccardo, D. Giachetti, J. I. Díaz, F. Murat, *Existence and regularity of renormalized solutions for some elliptic problems involving derivatives of nonlinear terms*, J. Differential Equations, **106** (1993), 215–237.

[6] L. Boccardo, A. Dall'Aglio, L. Orsina, *Existence and regularity results for some elliptic equations with degenerate coercivity*, dedicated to Prof. C. Vinti (Perugia, 1996), Atti Sem. Mat. Fis. Univ. Modena, **46** (1998), 51–81.

[7] G. Croce, *The regularizing effects of some lower order terms in an elliptic equation with degenerate coercivity*, Rendiconti di Matematica, **27** (2007), 299–314.

[8] G. Dal Maso, F. Murat, L. Orsina, A. Prignet, *Renormalized solutions for elliptic equations with general measure data*, Ann. Scuola Norm. Sup. Pisa Cl. Sci., **28** (1999), 741–808.

[9] J. Lennon, P. McCartney, *In my life*, Rubber Soul, 1965.

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