CACCIOPPOLI'S INEQUALITY
FOR QUASILINEAR ELLIPTIC OPERATORS

IVAN PERIĆ AND DARKO ŽUBRINIĆ

Abstract. We generalize Caccioppoli's inequality to the setting of quasilinear operators of Leray - Lions type, including arbitrary open subsets in $\mathbf{R}^N$, $N \geqslant 1$, instead of balls, and we obtain an explicit value of the constant on the right-hand side. The best Caccioppoli constant for the p-Laplacian is $\leqslant p^p$.

REFERENCES

[1] DAUTRAY R. & LIONS J.-L., *Analyse mathématique et calcul numerique por les sciences et les techniques, 2, L'Opérateur de Laplace*, Masson, Paris, (1987).

[2] GIAQUINTA M., *On differentiability of variational integrals*, in Nonlinear Analysis, Function Spaces and Applications, Teubner, (1982).

[3] GIAQUINTA M., *Multiple integrals in the calculus of variations and elliptic systems*, Princeton University Press, Princeton, New Jersey, (1983).

[4] GILBARG D., TRUDINGER N. S., *Elliptic partial differential equations of second order*, Springer-Verlag, Berlin, (1983).

[5] HEINONEN J., KILPELÄINEN T., MARTIO O., *Nonlinear potential theory of degenerate elliptic equations*, Oxford University Press, Oxford, (1993).

[6] KENIG C. E., *Harmonic analysis techniques for second order elliptic boundary value problems*, CBMS, 83, American Mathematical Society, Rhode Island, 1994.

[7] KILPELÄINEN T., KOSKELA P., *Global integrability of the gradients of solutions to partial differential equations*, Nonlinear Analysis, Vol. 23, No. 7, 1994, 899–909

[8] KINDERLEHRER D., STAMPACCHIA G., *An introduction to variational inequalities and their applications*, Academic Press, 1980.

[9] KORKUT L., PAŠIĆ M., ŽUBRINIĆ D., Some qualitative properties of quasilinear elliptic equations and applications, submitted for publication,

[10] MITROVIĆ D. & ŽUBRINIĆ D., *Fundamentals of applied functional analysis*, Pitman Monographs and Surveys in Pure and Applied Mathematics 91, Addison Wesley Longman, 1998.

ⓒ ELEMENT, Zagreb
Paper MIA-02-23

Mathematical Inequalities & Applications
www.ele-math.com
mia@ele-math.com