

## IMBEDDINGS OF ANISOTROPIC ORLICZ-SOBOLEV SPACES AND APPLICATIONS

PANKAJ JAIN, DAG LUKKASSEN, LARS-ERIK PERSSON AND NILS SVANSTEDT

*Mathematics subject classification (2000):* 26D10 , 26D15.

*Key words and phrases:* Inequalities, variational inequalities, imbeddings, Orlicz-Sobolev spaces, Young functions, applications.

### REFERENCES

- [1] R. A. ADAMS, *Sobolev Spaces*, Academic Press Inc., New York, 1975.
- [2] R. A. ADAMS, *Anisotropic Sobolev inequalities*, Časopis Pěst. Mat. **3** (1988), 267–279.
- [3] H. W. ALT AND S. LUCKHAUS, *Quasilinear elliptic-parabolic differential equations*, Math. Z., **183** (1983), 311–341.
- [4] G. ARONSEN, L. C. EVANS AND Y. WU, *Fast/slow diffusion and growing sandpiles*, J. Differential Equations, **131** 2, (1996), 304–335.
- [5] A. BENEDEK AND R. PANZONE, *The spaces  $L^p$  with mixed norms*, Duke Math. J. **28** (1961) 301–324.
- [6] A. CIANCHI, *A fully anisotropic Sobolev inequality*, Preprint no. **15** (1998), Dip. Mat. “U. Dini”, Univ. di Firenze.
- [7] G. DAL MASO, *An introduction to  $\Gamma$ -convergence*, Birkhäuser, Boston, 1993.
- [8] T. K. DONALDSON AND N. S. TRUDINGER, *Orlicz-Sobolev spaces and imbedding theorems*, J. Funct. Anal. **8** (1971), 52–75.
- [9] C. E. FINOL AND L. MALIGRANDA, *On a decomposition of some functions, comment.*, Math. Prace Mat. **30** (1991), 285–291.
- [10] B. FIRLE AND W. MATUSZEWSKA, *Some remarks on spaces provided with mixed norm*, Comment. Math. Prace Mat. **17** (1974), 347–357.
- [11] G. H. HARDY AND H. B. THOMPSON, *An imbedding theorem for anisotropic Orlicz-Sobolev spaces*, Bull. Austral. Math. Soc., **51** (1995), 463–467.
- [12] J. KACUR, *On a solution of degenerate elliptic-parabolic systems in Orlicz-Sobolev spaces I*, Math. Z., **203** (1990), 153–171.
- [13] V. S. KLIMOV, *Imbedding theorems and geometric inequalities*, Math. USSR Izvestija **10** (1976), 615–638.
- [14] I. M. KOLODII AND S. N. KRUSHKOV, *On the theory of embedding of anisotropic Sobolev spaces*, Russ. Math. Sury. **38** no.2 (1983) 188–189; translation from Usp. Mat. Nauk **38** no. 2 (230) (1983) 207–208.
- [15] E. YA. KHRUSLOV AND L. S. PANKRATOV, *Homogenization of the Dirichlet variational problems in Orlicz-Sobolev spaces, Operator Theory and its Applications* (Winnipeg, MB, 1998), 345–366, Fields Inst. Commun., **25**, Amer. Math. Soc., Providence, RI, 2000.
- [16] A. G. KOROLEV, *Embedding theorems for anisotropic Sobolev-Orlicz spaces*, Vestnik Moskovskogo Universiteta, Matematika, **38** (1983), 32–37.
- [17] A. KUFNER, O. JOHN AND S. FUČÍK, *Function Spaces*, Nordhoff International Publishing, Leyden, 1977.
- [18] J. RÁKOSNÍK, *Some remarks to anisotropic Sobolev spaces I*, Beitr. Anal. **13** (1979), 55–68.
- [19] J. RÁKOSNÍK, *Some remarks to anisotropic Sobolev spaces II*, Beitr. Anal. **15** (1981), 127–140.
- [20] M. S. SKAFF, *Vector valued Orlicz spaces, Generalized  $N$ -functions I*, Pacific J. Math. **28** (1969), 193–206.
- [21] M. S. SKAFF, *Vector valued Orlicz spaces, II*, Pacific J. Math. **28** (1969), 413–430.
- [22] N. SVANSTEDT, *G-convergence of parabolic operators*, Nonlinear Analysis TMA, Vol. **36**, no. 7, (1999), 807–843.

- [23] N. SVANSTEDT, *Correctors for the homogenization of monotone parabolic operators*, J. Nonlinear Mathematical Physics, Vol. **7** 3, (2000), (in print).
- [24] N. SVANSTEDT, N. WELLANDER AND J. WYLLER, *A numerical algorithm for nonlinear parabolic problems with highly oscillating coefficients*, Numerical Methods for Partial Differential Equations, Vol. **12** (1996), 423–440.
- [25] N. S. TRUDINGER, *An imbedding theorem for  $H^0(G, \Omega)$  spaces*, Studia Math. **50** (1974), 17–30.
- [26] S. WANG, *Convex functions of several variables and vector valued Orlicz spaces*, Bull. Acad. Pol. Sci. Sér. Sci. Math. Astronom. Phys. **11** (1963), 279–284.