SOME PROPERTIES OF GRAND SOBOLEV–MORREY SPACES WITH DOMINANT MIXED DERIVATIVES

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Abstract. In this paper we construct a grand Sobolev-Morrey spaces with dominant mixed derivatives, and by means of integral representation we study differential and differential-difference properties of functions from this spaces.

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REFERENCES

[1] T. I. AMANOV, *Representation and embedding theorems for function spaces SB*, Trudy Mat. Inst. Steklov., 77, Nauka, 1965, pp. 5–34.

[2] O. V. BESOV, V. P. IL'YIN AND S. M. NIKOLSKII, *Integral representations of functions and embeddings theorems*, M. Nauka, 1996, 480 pp.

[3] A. D. DJABRAILOV, *Families of spaces of function whose mixed derivatives satisfy a multiple-integral Hölder condition*, Trudy Mat.Inst. Steklov, 1972,v.117, pp. 139–158 (in Russian).

[4] T. IWANIEC AND C. SBORDONE, *On the integrability of the Jacobian under minimal hypotheses*, Arch. Ration. Mech. Anal., 119, 1992, pp. 129–143.

[5] A. FIORENZA AND C. E. KARADZHOV, *Grand and small Lebesgue spaces and their analogs*, J. Anal. Appl., vol. (23)(4) (2004), pp. 657–681.

[6] V. KOKILASHVILI, *The Riemann boundary value problem for analytic functions in the frame of grand L^p spaces*, Bull. Georgian Nat. Acad. Sci., vol. 4, No 1, 2010, pp. 5–7.

[7] V. KOKILASHVILI, A. MESKHI AND H. RAFEIRO, *Estimates for nondivergence elliptic equations with VMO coefficients in generalized grand Morrey spaces*, Comp. Var. Ellip. Equations, 8 (59), 2014, pp. 1169–1184.

[8] V. KOKILASHVILI AND A.MESKHI, *Trace inequalities for fractional integrals in grand Lebesgue spaces*, Studia Math., 210(2), 2012, pp. 159–176.

[9] A. MESKHI, *Maximal functions, potentials and singular integrals in grand Morrey spaces*, Comp. Var. Ellip. Equations, 2011, DOI: 10, 1080/17476933: 2010, 534793.

[10] Y.MIZUTA, T.OHNO, *Trudingers exponential integrability for Riesz potentials of function in generalized grand Morrey spaces*, J. Math. Anal. Appl., 420(1)(2014), pp. 268–278.

[11] A. M. NADZHAFOV, *Embedding theorems in the Sobolev-Morrey type spaces $S_{p,a,\varkappa,\tau}^l W(G)$ with dominant mixed derivatives*, Sib. Math. J., (47)(3), 2006, pp. 505–516.

[12] A. M. NAJAFOV, *Some properties of function from the intersection of Besov-Morrey type spaces with dominant mixed derivatives*, Proc. of A. Ramzmadze Math. Inst., 2005, v.139, pp. 71–82.

[13] A. M. NAJAFOV AND N. R. RUSTAMOVA, *Some differential properties of anisotropic grand Sobolev-Morrey spaces*, Trans. of A. Razmadze Mathematical Institute Vol. 172, Issue 1, 2018, pp. 82–89.

[14] A. M. NAJAFOV, *The differential properties of functions from Sobolev-Morrey type spaces of fractional order*, Journal of Mathematical Recearch, v.7, no 3, 2015, pp. 1–10.

[15] S. M. NIKOLSKII, *Functions with dominant mixed derivative satisfying a multiple Hölder condition*, Sib.M.Jour., 1963, v.4(6), pp. 1342–1364.

[16] H. RAFEIRO, *A note on boundedness of operators in grand Morrey spaces*, Arxiv: 1109, 2550 v1 [math. FA], 2011.

[17] S. G. SAMKO AND S. M. UMARKHADZHIEV, *On Iwaniec - Sbordone spaces on sets which may have infinite measure*, Azerb. Jour. Math. 2011, vol. 1, No 1, pp. 67–84, v.1, no 2, pp. 143–144.

[18] C. SBORDONE, *Grand Sobolev spaces and their applications to variational problems*, Le Mathematiche, vol. LI, 1996, Fasc. II, pp. 335–347.

[19] S. M. UMARKHADZHIEV, *The boundedness of the Riesz potential operator from generalized grand Lebesgue spaces to generalized grand Morrey spaces*, Operator Theory: Advances and Applications, Basel, 2014, vol.242, pp. 363–373.

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