

WEIGHTED ESTIMATES FOR BILINEAR FRACTIONAL INTEGRAL OPERATOR OF ITERATED PRODUCT COMMUTATORS ON MORREY SPACES

XIANG LI, QIANJUN HE* AND DUNYAN YAN

Abstract. In this paper we prove several weighted estimates for iterated product commutators generated by BMO-functions and the bilinear fractional integral operators on Morrey spaces. As a corollary we obtain new weighted estimates for Adams type inequality.

Mathematics subject classification (2010): 26A33, 42B25, 42B35.

Keywords and phrases: Iterated product commutator, bilinear fractional integral operator, Morrey space, BMO space, two weight.

REFERENCES

- [1] S. CHANILLO, *A note on commutators*, Indiana Univ. Math. J. 31 (1982), no. 1, 7–16.
- [2] R. R. COIFMAN, R. ROCHBERG AND G. WEISS, *Factorization theorems for Hardy spaces in several variables*, Ann. of Math. (2) 103 (1976), no. 3, 611–635.
- [3] T. IIDA, *Weighted inequalities on Morrey spaces for linear and multilinear fractional integrals with homogeneous kernels*, Taiwanese J. Math. 18 (2014), no. 1, 147–185.
- [4] T. IIDA, *Weighted estimates of higher order commutators generated by BMO-functions and the fractional integral operator on Morrey spaces*, J. Inequal. Appl. 2016, Paper No. 4, 23 pp.
- [5] T. IIDA, E. SATO, Y. SAWANO AND H. TANAKA, *Weighted norm inequalities for multilinear fractional operators on Morrey spaces*, Studia Math. 205 (2011), no. 2, 139–170.
- [6] F. JOHN AND L. NIRENBERG, *On functions of bounded mean oscillation*, Comn. Pure Appl. Math. 14 (1961), 415–426.
- [7] B. MUCKENHOUPT AND R. L. WHEEDEN, *Weighted norm inequalities for fractional integrals*, Trans. Amer. Math. Soc. 192 (1974), 261–274.
- [8] C. PÉREZ, *Two weighted inequalities for potential and fractional type maximal operators*, Indiana Univ. Math. J. 43 (1994), no. 2, 663–683.
- [9] C. PÉREZ, *On sufficient conditions for the boundedness of the Hardy-Littlewood maximal operator between L^p spaces with different weights*, Proc. London Math. Soc. (3) 71 (1995), no. 1, 135–157.
- [10] C. PÉREZ, *Sharp L^p -weighted Sobolev inequalities*, Ann. Inst. Fourier (Grenoble) 45 (1995), no. 3, 809–824.
- [11] C. PÉREZ AND ISRAEL P. RIVERA-RIOS, *Borderline weighted estimates for commutators of singular integrals*, Israel J. Math. 217 (2017), no. 1, 435–475.
- [12] Y. SAWANO, S. SUGANO AND H. TANAKA, *Generalized fractional integral operators and fractional maximal operators in the framework of Morrey spaces*, Trans. Amer. Math. Soc., 363 (2011), no. 12, 6481–6503.
- [13] H. TANAKA, *Morrey space and fractional operators*, J. Aust. Math. Soc. 88 (2010), no. 2, 247–259.