Journal of Mathematical Inequalities
Volume 17, Number 3 (2023), 1211–1221
doi:10.7153/jmi-2023-17-79

SHARP BOUND OF m–LINEAR n–DIMENSIONAL p–ADIC HAUSDORFF OPERATORS ON p–ADIC MORREY SPACES

XIRAN ZHANG, QIANJUN HE AND XIANG LI*

Abstract. In this paper, we study the sharp bound for m-linear n-dimensional p-adic Hausdorff operators on central and noncentral p-adic Morrey spaces with power weights, and we also give the sharp bonds of p-adic Hausdorff operators on central and noncentral p-adic Morrey spaces. Moreover, this is a generalization of the previous results.

Mathematics subject classification (2020): Primary 42B25; Secondary 26D15.
Keywords and phrases: Sharp bound, p-adic Hausdorff operator, p-adic Morrey space, power weights.

REFERENCES

[1] S. ALBEVERIO AND W. KARWOSKI, *A random walk on p-adics: the generator and its spectrum*, Stochastic Process. Appl. **53** (1994), 1–22.
[2] S. ALBEVERIO, A. YU. KHRENNIKOV AND M. SHELKOVICH, *Theory of p-adic distributions: linear and nonlinear models*, London Mathematical Lecture Note series, vol. 370, Canbridge University Press, Cambridge, 2010.
[3] A. V. AVETISOV, A. H. BIKULOV, S. V. KOZYREV AND V. A. OSIPOV, *p-adic models of ultrametric diffusion constrained by hierarchical energy landscapes*, J. Phys. A: Math. Gen. **35** (2002), 177–189.
[4] T. BATBLOD AND Y. SAWANO, *Sharp bounds for m-linear Hilbert-type operators on the weighted Morrey spaces*, Math. Inequal. Appl. **20** (1) (2017), 263–283.
[5] Á. BÉNYI AND C. T. OH, *Best constants for certain multilinear integral operators*, J. Inequal. Appl. **2006** (2006), 1–12.
[6] Y. DENG, D. YAN AND M. WEI, *Sharp estimates for m-linear p-adic Hardy and Hardy-Littlewood-Pólya operators on p-adic central Morrey spaces*, preprint, 2021.
[7] G. L. GAO, X. M. WU AND W. C. GUO, *Some results for Hausdorff operators*, Math. Ineq. Appl. **18** (1) (2015), 155–168.
[8] G. H. HARDY, J. E. LITTLEWOOD AND G. PÓLYA, *Inequalities*, Cambridge University Press, Cambridge, 1952.
[9] Q. J. HE, M. Q. WEI AND D. Y. YAN, *Characterizations of p-adic central Campanato spaces via commutator of p-adic Hardy type operators*, J. Korean Math. Soc. **56** (3) (2019), 767–787.
[10] Q. J. HE, M. Q. WEI AND D. Y. YAN, *Sharp bound for generalized m-linear n-dimensional Hardy-Littlewood-Pólya operator*, Anal. Theory Appl., 39, (2023), 28–41.
[11] A. KHRENNIKOV, *p-adic valued distributions in mathematical physics*, Kluwer, Dordrechht, 1994.
[12] A. KHRENNIKOV, *Non-Archimedean analysis: Quantum Paradoxes*, Dynamical Systems and Biological Models, Kluwer, Dordrechht, 1997.
[13] Y. C. KIM, *Carleson measures and the* BMO *space on the p-adic vector space*, Math. Nachr. **282** (9) (2009), 1278–1304.
[14] Y. C. KIM, *Weak type estimates of square functions associated with quasiradial Bochner-Riesz means on certain Hardy spaces*, J. Math. Anal. Appl. **339** (1) (2008), 266–280.
[15] X. LI, X. R. ZHANG AND Q. J. HE, *Sharp bounds for generalized m-linear n-dimensional p-adic Hardy-Littlewood-Pólya operator*, J. Funct. Spaces, 2021, Article ID 5366843, 8 pages.
[16] K. S. RIM AND J. LEE, *Estimate of weighted Hard-Littlewood averages on the p-adic vector space*, J. Math. Anal. Appl. **324** (2006), 1470–1477.

Paper JMI-17-79

[17] K. M. ROGERS, *A van der Corput lemma for the p-adic numbers*, Proc. Amer. Math. Soc. **133** (12) (2005), 3525–3534.
[18] K. M. ROGERS, *Maximal averages along curves over the p-adic numbers*, Bull. Austral. Math. Soc. **70** (3) (2004), 357–375.
[19] S. G SHI, Z. W. FU AND S. Z. LU, *On the compactness of commutators of Hardy operators*, Pacific J. Math., **307** (2020), 239–256.
[20] M. H. TAIBLESON, *Fourier analysis on local fields*, Princeton University Press, Princeton, 1975.
[21] V. S. VARADARAJAN, *Path integrals for a class of p-adic Schrödinger equations*, Lett. Math. Phys. **39** (1997), 97–106.
[22] V. S. VLADIMIRON, I. V. VOLOVICH, E. I. ZELENOV, *p-adic Analysis and Mathematical Physics*, Series on Soviet and East European Mathematics, vol. I, World Scientific, Singapore, 1992.
[23] Q. Y. WU AND Z. W. FU, *Sharp estimates of m-linear p-adic Hardy and Hardy-Littlewood-Pólya operators*, J. Appl. Math. **2011** (2011), 1–20.
[24] X. M. WU, G. L. GAO AND X. YU, *The boundedness of Hausdorff operators on Campanato spaces*, Acta. Math. Sin. (Chin. Ser.) 57 (1) (2014), 1–8.
[25] X. S. ZHANG, M. Q. WEI AND D. Y. YAN, *Sharp bounds of Hausdorff operators on Morrey spaces with power weights*, J. Univ. Chinese Academy Sci., 38 (5) (2021), 577–582.