

WEIGHTED ESTIMATES FOR A CLASS OF MATRIX OPERATORS

NAZERKE ZHANGABERGENOVA

Abstract. In this paper, we have obtained criteria for the fulfillment of weighted inequalities for the class of quasilinear discrete operators involving matrix kernels.

Mathematics subject classification (2020): 26D15, 26D20.

Keywords and phrases: Inequality, Hardy-type operator, weights, weighted sequence space, quasilinear operator, matrix operator.

REFERENCES

- [1] G. BENNETT, *Some elementary inequalities*, III. Quart. J. Math. Oxford Ser., **42**, 2 (1991), 149–174.
- [2] G. BENNETT, *Some elementary inequalities*, Quart. J. Math. Oxford Ser., **38**, 2 (1987), 401–425.
- [3] V. I. BURENKOV AND R. OINAROV, *Necessary and Sufficient conditions for boundedness of the Hardy-type operator from a weighted Lebesgue space to a Morrey-type space*, Math. Inequal. Appl., **16**, 1 (2013), 1–19.
- [4] A. GOGATISHVILI, R. MUSTAFAYEV AND L.-E. PERSSON, *Some new iterated Hardy-type inequalities*, Func. Spaces. Appl., **2012**, 1–31, <https://doi.org/10.1155/2012/734194>.
- [5] A. GOGATISHVILI, R. MUSTAFAYEV AND L.-E. PERSSON, *Some new iterated Hardy-type inequalities: the case $q = 0$* , J. Inequal. Appl., **515**, (2013), 29.
- [6] A. GOGATISHVILI, M. KRĚPĚLA, R. OL'HAVA AND L. PICK, *Weighted inequalities for discrete iterated Hardy operators*, Mediter. J. Math., **17**, 4 (2020), 132–148, <https://doi.org/10.1007/s00009-020-01526-2>.
- [7] A. GOGATISHVILI, L. PICK AND T. UNVER, *Weighted inequalities for discrete iterated kernel operators*, Mathematische Nachrichten, **295**, 11 (2021), 2069–2264.
- [8] M. I. A. CANESTRO, P. O. SALVADOR AND C. R. TORREBLANCA, *Weighted bilinear Hardy inequalities*, Math. Anal. and Appl., **387**, (2012), 320–334.
- [9] P. JAIN, S. KANJILAL, G. E. SHAMBILOVA AND V. D. STEPANOV, *Bilinear weighted Hardy-type inequalities in discrete and q -calculus frameworks*, Math. Inequal. Appl., **23**, 4 (2020), 1279–1310.
- [10] A. KALYBAY, *Weighted estimates for a class of quasilinear integral operators*, Siberian Math. J., **60**, 2 (2019), 291–303, (in Russian).
- [11] A. KALYBAY, *Weighted estimates for a class of quasilinear integral operators*, Siberian Math. J., **60**, 2 (2019), 376–390, (in Russian).
- [12] A. KALYBAY, A. TEMIRKHANOVA AND N. ZHANGABERGENOVA, *On iterated discrete Hardy type inequalities for a class of matrix operators*, Anal. Math., (2022), <https://doi.org/10.1007/s10476-022-0182-2>.
- [13] R. OINAROV AND A. A. KALYBAY, *Three parameter weighted Hardy-type inequalities*, Banach Journal Math., **2**, 2 (2008), 85–93.
- [14] R. OINAROV AND A. A. KALYBAY, *Weighted estimates of a class of integral operators with three parameters*, J. Funct. Spaces. Appl., **2016**, 11.
- [15] R. OINAROV, C. A. OKPOTI AND L.-E. PERSSON, *Weighted inequalities of Hardy type for matrix operators: the case $q < p$* , Math. Inequal. Appl., **10**, 4 (2007), 843–861.
- [16] R. OINAROV, B. K. OMARBAYEVA AND A. M. TEMIRKHANOVA, *Discrete iterated Hardy-type inequalities with three weights*, Vestnik KazNU, math. mech. comp. sci. ser., **105**, 1 (2020), 19–29.
- [17] R. OINAROV AND S. KH. SHALGYNBAEVA, *Weighted additive estimate of a class of matrix operators*, Izvestiya NAN RK, serial Phys.-Mat., **7**, 1 (2004), 39–49. (in Russian).

- [18] B. K. OMARBAYEVA, L.-E. PERSSON AND A. M. TEMIRKHANOVA, *Weighted iterated discrete Hardy-type inequalities*, *Math. Ineq. Appl.*, **23**, 3 (2020), 943–959, [doi:10.7153/mia-2020-23-73](https://doi.org/10.7153/mia-2020-23-73).
- [19] D. V. PROKHOROV AND V. D. STEPANOV, *On weighted Hardy inequalities in mixed norms*, *Tr. MIAN.*, **283**, (2013), 155–170, (in Russian).
- [20] S. SHAIMARDAN AND S. SHALGYNBAEVA, *Hardy-type inequalities for matrix operators*, *Bulletin of the Karaganda University – Mathematics*, **88**, 4 (2017), 63–72.
- [21] V. D. STEPANOV AND G. E. SHAMBILOVA, *On weighted iterated Hardy-type operators*, *Anal. Math.*, **44**, 2 (2018), 273–283.
- [22] A. TEMIRKHANOVA, *Estimates for Discrete Hardy-type Operators in Weighted Sequence Spaces*, PhD thesis, Department of Mathematics, Lulea University of Technology, (2015).