

MIXED INTEGRAL OPERATOR OF THE VOLTERRA CONVOLUTION TYPE IN WEIGHTED GENERALIZED HÖLDER SPACE

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Abstract. Weighted Zygmund type estimates are obtained for the mixed continuity modulus of some convolution type integrals. In the case of mixed fractional integrals this strengthened to a result on isomorphism between certain weighted generalized Hölder type spaces

1. Introduction

In [3]-[10] the kernel and the weight function were power functions. Now, in the paper we deal here with arbitrary kernels and weights, i.e. not necessarily power ones. We study mixed integral of the Volterra convolution type of function of two variables in weighted generalized Hölder spaces of different orders in each variables.

We consider mixed integral operator of the Volterra convolution type

$$(\tilde{K}\varphi)(x_1, x_2) = \int_0^{x_1} \int_0^{x_2} k(x_1 - t_1)k(x_2 - t_2)\varphi(t_1, t_2)dt_1dt_2 \quad (1.1)$$

in rectangle $Q = \{(x_1, x_2) : 0 \leq x_1 \leq b_1, 0 \leq x_2 \leq b_2\}$.

We obtain weighted Zygmund type estimates for mixed integrals of the Volterra convolution type in the weighted generalized Hölder space of the function of two variables defined by the mixed modulus of continuity. Estimates of Zygmund type make it possible to reveal the nature of the action of mixed integral operators of the Volterra convolution type in weighted generalized Hölder spaces. We consider weighted generalized Hölder spaces defined both by first order differences in each variable and also by the mixed second order difference, the main interest being in the evaluation of the latter for the

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