Approximating of functions from holder classes Hα [0, 1] by haar wavelets

ABSTRACT

In the present work, a new direct computational method for solving definite integrals based on Haar wavelets is introduced. The definite integral of the functions from Holder classes is replaced with the approximation of the function by Haar wavelets and the the calculation of definite integrals is reduced to the problem of solving algebraic equation formed by the Fourier coefficients in terms of Haar wavelets. Based on the properties of the Haar wavelets it is shown that the such approximations much better approximate the value of the integrals for the functions from Holder classes. The Error analysis of the approximation method are worked out in the classes of Holder to show the efficiency of the new method and connection of the module of difference with smoothness of the function is established. Finally, some numerical examples of the implementation the method for the functions from Holder classes are presented.