DEGREE OF APPROXIMATION OF FUNCTIONS BELONGING TO LIPα CLASS AND WEIGHTED ($L^r,\xi(t)$) CLASS BY PRODUCT SUMMABILITY METHOD

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Abstract. A good amount of work has been done on degree of approximation of functions belonging to $Lip\alpha$, $Lip(\alpha, r)$, $Lip(\xi(t), r)$ and $W(L^r, \xi(t))$ classes using Cesàro and (generalized) Nörlund single summability methods by a number of researchers like Alexits [1], Sahney and Goel [11], Qureshi and Neha [9], Quershi [7, 8], Chandra [2], Khan [4], Leindler [5] and Rhoades [10]. But till now no work seems to have been done so far in the direction of present work. Therefore, in present paper, two quite new results on degree of approximation of functions $f \in Lip\alpha$ and $f \in W(L^r, \xi(t))$ class by (E,1)(C,1) product summability means of Fourier series have been obtained.

Full text

References

[1] G. Alexits, *Convergence problems of orthogonal series.* Translated from German by I Földer. International series of Monograms in Pure and Applied Mathematics, vol. **20**, Pergamon Press, New York-Oxford-Paris, 1961. MR0218827(36:1911).

[2] P. Chandra, *Trigonometric approximation of functions in L^p norm*, J. Math. Anal. Appl. **275** (2002), No. 1, 13-26. MR1941769(2003h:42003). Zbl 1011.42001.

[3] G. H. Hardy, *Divergent series*, first edition, Oxford University Press, 1949, 70.

[4] H. H. Khan, *On degree of approximation of functions belonging to the class $Lip(\alpha, p)$*, Indian J. Pure Appl. Math., **5** (1974), no. 2, 132-136. MR0380230(52 :1130). Zbl 0308.41010.

[5] L. Leindler, *Trigonometric approximation in L^p norm*, J. Math. Anal. Appl., **302** (2005). MR2107350(2005g:42004). Zbl 1057.42004.

[6] L. McFadden, *Absolute Nörlund summability*, Duke Math. J., **9** (1942), 168-207. MR0006379(3,295g). Zbl 0061.12106.

[7] K. Qureshi, *On the degree of approximation of a periodic function f by almost Nörlund means*, Tamkang J. Math., **12** (1981), No. 1, 35-38. MR0714492(85h:42002). Zbl 0502.42002.

[8] K. Qureshi, *On the degree of approximation of a function belonging to the class Lipα*, Indian J. pure Appl. Math., **13** (1982), no. 8, 898-903. MR0670332(84c:41013). Zbl 0498.42002.

[9] K. Qureshi and H. K. Neha, *A class of functions and their degree of approximation*, Ganita, **41** (1990), no. 1, 37-42. MR1155949. Zbl 0856.42005.

[10] B. E. Rhaodes, *On the degree of approximation of functions belonging to Lipschitz class by Hausdorff means of its Fourier series*, Tamkang Journal of Mathematics, **34** (2003), no. 3, 245-247. MR2001920(2004g:41023). Zbl 1039.42001.

[11] B. N. Sahney and D. S. Goel, *On the degree of continuous functions*, Ranchi University Math. Jour., **4** (1973), 50-53. MR0352846(50:5332). Zbl 0296.41008.

[12] E. C. Titchmarsh, *The Theory of functions*, Oxford University Press, 1939, 402-403.

[13] A. Zygmund, *Trigonometric series*, 2nd rev. ed., Vol. **1**, Cambridge Univ. Press, Cambridge, New York, 1959. MR0107776(21:6498). Zbl 0085.05601.

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