Analele Universităţii Oradea
Fasc. Matematica, Tom XXII (2015), Issue No. 1, 41–46

L^1-CONVERGENCE OF A SET OF MODIFIED SUMS

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Abstract. In this paper we have defined a new class of numerical sequences tending to zero briefly denoted by $\mathbb{R}^{\log}$. Moreover, we have introduced the set of following trigonometric modified sums by

$$\Phi_n(x) = \frac{a_0}{2} + \sum_{k=1}^{n}\sum_{j=k}^{n}\left(\sum_{i=j}^{n}\triangle^2\left(\frac{a_i}{i}\right)\right)k\cos kx$$

and

$$\Psi_n(x) = \sum_{k=1}^{n}\sum_{j=k}^{n}\left(\sum_{i=j}^{n}\triangle^2\left(\frac{a_i}{i}\right)\right)k\sin kx,$$

and studied their L^1-convergence. Finally, we deduce conditions under which a cosine trigonometric series converges in L^1-norm.

References

[1] B. Ram, *Convergence of certain cosine sums in the metric space L*, Proc. Amer. Math. Soc. 66 (1977) 258–260.
[2] B. Ram, *Integrability of Ress-Stanojević sums*, Acta Sci. Math. 42 (1980) 153–155.
[3] C. S. Rees and Stanojević Č. V., *Necessary and sufficient condition for intergrability of certain cosine sums*, J. Math. Anal. Appl. 43 (1973), 579–586.
[4] J. Kaur, S. S. Bhatia, *Convergence of modified complex trigonometric sums in the metric space L*, Lobachevskii J. Math. Vol. 31, No. 3 (2010) 290–294.
[5] L. Leindler, *Additions to the Telyakovskiĭ class S*, J. Ineq. Pure and Appl. Math. 4 Art. 35, (2003).
[6] N. K. Bary, *A treatise on trigonometric series* (London: Pergamon Press) Vol.II (1964).
[7] S. A. Telyakovskiĭ , *On a sufficient condition of Sidon for integrability of trigonometric series*, Math. Zametki, (in Russian) 14 (1973), 317–328.
[8] Sh. Y. Sheng, *The extensions of the theorems of Č. V. Stanojević and V. B. Stanojević*, Proc. Amer. Math. Soc. 110 (1990), no. 4, 895–904.
[9] S. Kumari, B. Ram, *L^1-convergence of certain trigonometric sums*, Indian J. Pure Appl. Math. 20 (9), (1989) 908–914.
[10] T. Kano, Coefficients of some trigonometric series, *J. Fac. Sci. Shinshu Univ.* 3 (1968), 153–162.
[11] Xh. Z. Krasniqi, *Some new modified cosine sums and L^1-convergence of cosine trigonometric series*, Arch. Math. (Brno), Tomus 49 (2013), 43–50.
[12] Xh. Z. Krasniqi, *On L^1-convergence of Rees-Stanojevic's sums with coefficients from the class K*, Matematiche (Catania), Vol. LXV (2010)–Fasc. II, pp. 25–32 doi: 10.4418/2010.65.2.3.
[13] Ž. Tomovski, *On a theorem of S. S. Bhatia and B. Ram*, Math. Commun, 8 (2003), 187–193.

Received 27 October 2013

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2010 *Mathematics Subject Classification.* 42A20, 42A32.
Key words and phrases. L^1-convergence, null sequence, trigonometric series, modified sums.