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L^1-CONVERGENCE OF XHEVAT MODIFIED SUMS IN TWO DIMENSIONS

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Abstract: In this paper, X.Z. Krasniqi modified trigonometric sine sum is extended from one dimension to two dimension and the integrability and L^1 - convergence of double cosine series under new coefficients of numerical sequences has been studied.

Keywords and Phrases: Dirichlet kernel, Fejer kernel, Integrability, L^1- convergence, double trigonometric series.

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1. Introduction

Let

$$\sum_{j=0}^{\infty}\sum_{k=0}^{\infty}\lambda_j\lambda_k q_{jk}^d\cos jx_1\cos kx_2 \tag{1.1}$$

be the double cosine series on the positive quadrant $Q=[0,\pi]\times[0,\pi]$ of the two dimensional torus, where $\lambda_0=1/2$ and $\lambda_j=1$ if $j\geq 1$; q_{jk}^d are real coefficients and let

$$S_{mn}^d(x_1,x_2)=\sum_{j=0}^{m}\sum_{k=0}^{n}\lambda_j\lambda_k q_{jk}^d\cos jx_1\cos kx_2 \qquad (m,n\geq 0)$$

be the rectangular partial sum of the series (1.1) and $f^d(x_1,x_2)=\lim\limits_{m,n\to\infty}S_{mn}^d(x_1,x_2)$.

Bounded Variation. The real coefficients $\{q_{jk}^d\}$ form a null sequence of bounded