THE MAXIMAL OPERATOR OF MARCINKIEWICZ–FEJÉR MEANS WITH RESPECT TO WALSH–KACZMARZ–FOURIER SERIES

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Abstract. In the paper [4, Theorem 1] Gát, Goginava and the author proved that the maximal operator $\sigma^{k,r}$ of Marcinkiewicz-Fejér means of Walsh-Kaczmarz-Fourier series, is bounded from the dyadic Hardy space $H_p$ into the space $L_p$ for $p > 2/3$. Moreover, Goginava and the author showed that $\sigma^{k,r}$ is not bounded from the Hardy space $H_{2/3}$ to the space $L_{2/3}$ [6, Theorem 1]. The main aim of this paper is to show that the maximal operator $\tilde{\sigma}^{k,r} f := \sup_{n \in \mathbb{P}} |\sigma^{k,r}_n f| \log^{3/2}(n+1)$ is bounded from the Hardy space $H_{2/3}$ into the space $L_{2/3}$. Moreover, we prove that the order of deviant behavior of the $n$th Walsh-Kacmarz-Marcinkiewicz-Fejér mean is exactly $\log^{3/2}(n+1)$ in the endpoint $p = 2/3$.


Keywords and phrases: Walsh-Kaczmarz system, Marcinkiewicz means, maximal operator, two-dimensional system.

REFERENCES


