

Summability of a Tchebysheff system of functions

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Abstract. We consider a special type of Tchebysheff systems of functions $\{u_i(\cdot)\}_{i=0}^n$ and $\{v_i(\cdot)\}_{i=0}^n$ defined on the intervals $(0, 1]$ and $[1, +\infty)$, respectively, such that

$$u_i(t) = t^{\alpha_0} \int_t^1 t_1^{\alpha_1} \int_{t_1}^1 t_2^{\alpha_2} \dots \int_{t_{i-1}}^1 t_i^{\alpha_i} dt_i dt_{i-1} \dots dt_1$$

and

$$v_i(t) = t^{\beta_0} \int_1^t t_1^{\beta_1} \int_1^{t_1} t_2^{\beta_2} \dots \int_1^{t_{i-1}} t_i^{\beta_i} dt_i dt_{i-1} \dots dt_1.$$

We find necessary and sufficient conditions under which functions from the investigated systems belong to the corresponding Lebesgue spaces $L_p(0, 1)$ and $L_p(1, +\infty)$. In order to prove the main results we obtain lower and upper estimates of these functions that are of independent interest.

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