

New classes of rearrangement-invariant spaces appearing in extreme cases of weak interpolation

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Abstract. We study weak type interpolation for ultrasymmetric spaces $L_{\phi,E}$, i.e., having the norm $\|\phi(t)f^*(t)\|_{\tilde{E}}$, where $\phi(t)$ is any quasiconcave function and \tilde{E} is arbitrary rearrangement-invariant space with respect to the measure dt/t . When spaces $L_{\phi,E}$ are not “too close” to the endpoint spaces of interpolation (in the sense of Boyd), the optimal interpolation theorem was stated in [13]. The case of “too close” spaces was studied in [15] with results which are optimal, but only among ultrasymmetric spaces. In this paper we find better interpolation results, involving new types of rearrangement-invariant spaces, $A_{\phi,b,E}$ and $B_{\phi,b,E}$, which are described and investigated in detail.

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