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Permutation-Invariance in Komlós' Theorem for Hilbert-Space Valued Random Variables

The Komlós theorem states that we can extract a subsequence from every $L_{\mathbb{R}}^1$-bounded sequence of random variables, so that every further subsequence converges Cesàro a.e. to the same limit. The purpose of this paper is to prove that if $\mathbb{H}$ is a Hilbert space, we can extract a subsequence from every $L_{\mathbb{H}}^1$-bounded sequence, so that every permuted subsequence converges Cesàro a.e. in $\mathbb{H}$ to the same limit.

Keywords: Bounded sequences, Cesaro-convergence, Hilbert space, Komlos theorem, permutation.

MSC: 28A20, 46B20.