

Complete convergence of weighted sums in Banach spaces and the bootstrap mean

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Abstract

Let $\{X_{ni}, 1 \leq i \leq k_n, n \geq 1\}$ be an array of rowwise independent random elements taking values in a real separable Banach space, and $\{a_{ni}, 1 \leq i \leq k_n, n \geq 1\}$ an array of constants. Under some conditions of Chung [7] and Hu and Taylor [10] types for the arrays, and using a theorem of Hu et al. [9], the equivalence amongst various kinds of convergence of $\sum_{i=1}^{k_n} a_{ni}X_{ni}$ to zero is obtained. It leads to an unified vision of recent results in the literature. The authors use the main result in the paper in order to obtain the strong consistency of the bootstrapped mean of random elements in a Banach space from its weak consistency.

Keywords

Banach spaces, Bootstrap mean, Complete convergence, Random elements, Row-wise independence, Weighted sums