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TIGHTNESS CRITERIA FOR RANDOM MEASURES WITH APPLICATION TO THE PRINCIPLE OF CONDITIONING IN HILBERT SPACES

Adam Jakubowski

Abstract: Suppose that $\{\mu_n\}$ is a sequence of random probability measures on a real and separable Hilbert space such that, for each $n \in N$, μ_n is a pointwisely convergent convolution of some sequence $\{\mu_{nk} | k \in N\}$ of random measures. The sequence $\{\mu_n\}$ is said to be $shift - tight$ if one can find random vectors $\{A_n\}$ such that the "centered" sequence $\{\mu_n * \delta_{-A_n}\}$ is tight.

It is proved that for a shift-tight sequence $\{\mu_n\}$ there exists a "progressively measurable" centering which changes $\{\mu_n\}$ into a tight sequence.

As an application, Principle of Conditioning and Martingale Central Limit Theorem in a Hilbert space are proved.

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