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WEAK CONVERGENCE OF RANDOM VECTORS AND DISTRIBUTIONS IN BANACH SPACES

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Abstract: Let (ξ_n) be a sequence of random vectors with values in a Banach space X with distributions p_{ξ_n} weakly converging to a given distribution p. We characterize a general form of a distribution of a weak limit of ξ_n in Banach space $L_1(X)$ of Bochner integrable vectors. We show that the weak convergence of random vectors (ξ_n) in $L_1(X)$ implies that $\|\xi_n(\omega) - \xi(\omega)\| \to 0$ stochastically. Moreover, the conditions $\|\xi_n(\omega) - \xi(\omega)\| \to 0$ stochastically and $\langle \xi_n(\omega) - \xi(\omega), x^* \rangle \to 0$ stochastically for any $x^* \in X^*$ are equivalent.

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