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ON THE APPROXIMATION OF A RANDOM VARIABLE BY A CONDITIONING OF A GIVEN SEQUENCE

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Abstract: Let $(\Omega, \mathfrak{F}, P)$ be a non-atomic probability space. If (X_n) is a sequence of r.v.'s satisfying $X_n \to 0$ a.s. (respectively, in probability) as $n \to \infty$ and $EX_n^+ \to \infty$, $EX_n^- \to \infty$ as $n \to \infty$, then for any r.v. Y there exists a sequence $(\mathfrak{U}_n)$ of σ-fields such that $E(X_n|\mathfrak{U}_n|) \to Y$ a.s. (respectively, in probability) as $n \to \infty$.

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