COMPLETE EXACT LAWS

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Abstract: Consider independent and identically distributed random variables \(\{X, X_n, n \geq 1\}\) with \(xP\{X > x\} \sim a(\log x)^{\alpha}\), where \(\alpha > -1\) and \(P\{X < -x\} = o(P\{X > x\})\). Even though the mean does not exist, we establish Laws of Large Numbers of the form

\[
\sum_{n=1}^{\infty} c_n P\left\{\left| \frac{\sum_{k=1}^{n} a_k X_k}{b_n} - L \right| > \varepsilon \right\} < \infty
\]

for all \(\varepsilon > 0\) and a particular nonsummable sequence \(\{c_n, n \geq 1\}\), where \(L \neq 0\).

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The full text is available here