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ON EXACT STRONG LAWS FOR SUMS OF MULTIDIMENSIONALLY INDEXED RANDOM VARIABLES

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Abstract: Let $\{X, X_n, n \in Z_+^d\}$ be independent and identically distributed random variables satisfying $xP(|X| > x) \approx L(x)$ with either $EX = 0$ or $E|X| = \infty$, where $L(x)$ is slowly varying at infinity. This paper proves that there always exist sequences of constants $\{a_n\}$ and $\{B_N\}$ such that an Exact Strong Law holds, that is

$$\sum_{|n| \le N} a_n X_n / B_N \to 1 \text{ almost surely} \quad \text{as } N \to \infty.$$

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