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ON STABILITY OF TRIMMED SUMS

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Abstract: Let $\{X_n, n \geq 1\}$ be a sequence of i.i.d. random variables and let $\{a_n, n \geq 1\}$ and $\{b_n, n \geq 1\}$ be sequences of constants where $0 < b_n \uparrow \infty$. Let $X_n^{(1)}, X_n^{(2)}, \ldots, X_n^{(n)}$ be a rearrangement of $X_1, \ldots, X_n$ such that $|X_n^{(1)}| \geq |X_n^{(2)}| \geq \ldots \geq |X_n^{(n)}|$. Consider the sequence of weighted sums $T_n = \sum_{i=1}^n a_i X_i, n \geq 1$, and, for fixed $r \geq 1$, set $T_n^{(r)} = \sum_{i=1}^n a_i X_i I(|X_i| \leq |X_n^{(r+1)}|), n \geq r+1$; i.e., $T_n^{(r)}$ is the sum T_n minus the sum of the $X_n^{(k)}$'s multiplied by their corresponding coefficients for $k = 1, \ldots, r$. The main results provide sufficient and, separately, necessary conditions for $b_n^{-1} T_n^{(r)} - k_n \to 0$ almost surely for some sequence of centering constants $\{k_n, n \geq 1\}$. The current work extends that of Mori [14], [15] wherein $a_n \equiv 1$.

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