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An Inequality for the Asymmetry of Distributions and a Berry-Esseen Theorem for Random Summation

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Abstract: We consider random numbers N_n of independent, identically distributed (i.i.d.) random variables X_i and their sums $\sum_{i=1}^{N_n} X_i$. Whereas Blum, Hanson and Rosenblatt [3] proved a central limit theorem for such sums and Landers and Rogge [8] derived the corresponding approximation order, a Berry-Esseen type result seems to be missing. Using an inequality for the asymmetry of distributions, which seems to be of its own interest, we prove, under the assumption $N_n/n \rightarrow \tau$ (in an appropriate sense), a Berry-Esseen theorem for random summation.



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