Near-consistent robust estimations of moments for unimodal distributions

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A. Invariant Moments. All commonly used robust location estimators are symmetric, and therefore, asymptotically coincide in any symmetric distributions. A γ-weighted Hodges-Lehmann mean ($\mathrm{WHLM}_{k,\epsilon,\gamma,n}$) can achieve consistency in any γ-symmetric distribution with a finite mean.