# Near-consistent robust estimations of moments for unimodal distributions

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**A. Robust Estimations of the Central Moments.** In 1979, Bickel and Lehmann (1), in their final paper of the landmark series *Descriptive Statistics for Nonparametric Models*, generalized a class of estimators called measures of spread, which "do not require the assumption of symmetry." From this, Rousseeuw and Croux proposed a popular efficient scale estimator (2) in 1993.

**Theorem A.1.**

*Proof.* □

1. PJ Bickel, EL Lehmann, Descriptive statistics for nonparametric models iv. spread in *Selected Works of EL Lehmann.* (Springer), pp. 519–526 (2012).
2. PJ Rousseeuw, C Croux, Alternatives to the median absolute deviation. *J. Am. Stat. association* **88**, 1273–1283 (1993).