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M-estimation in nonparametric regression under strong dependence and infinite variance

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Abstract A robust local linear regression smoothing estimator for a nonparametric regression model with heavy-tailed dependent errors is considered in this paper. Under certain regularity conditions, the weak consistency and asymptotic distribution of the proposed estimators are obtained. If the errors are short-range dependent, then the limiting distribution of the estimator is normal. If the data are long-range dependent, then the limiting distribution of the estimator is a stable distribution.

Keywords Heavy-tailed · Long-range dependence · M-estimation · Nonparametric regression · Stable distribution