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Estimating a uniform distribution when data are measured with a normal additive error with unknown variance


**Abstract.** The problem of estimating the width of a symmetric uniform distribution on the line together with the error variance, when data are measured with normal additive error, is considered. The main purpose is to analyze the maximum likelihood estimator and to compare it with the moment method estimator. It is shown that this two-parameter model is regular so that the maximum likelihood estimator is asymptotically efficient. Necessary and sufficient conditions are given for the existence of the maximum likelihood estimator. As numerical problems are known to frequently occur while computing the maximum likelihood estimator in this model, useful suggestions for computing the maximum likelihood estimator are also given.