

WEAK CONSISTENCY OF MODIFIED VERSIONS OF BAYESIAN
INFORMATION CRITERION IN A SPARSE LINEAR REGRESSION

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Abstract: We consider the regression model in the situation when the number of available regressors p_n is much bigger than the sample size n and the number of nonzero coefficients p_{0n} is small (the sparse regression). To choose the regression model, we need to identify the nonzero coefficients. However, in this situation the classical model selection criteria for the choice of predictors like, e.g., the Bayesian Information Criterion (BIC) overestimate the number of regressors. To address this problem, several modifications of BIC have been recently proposed. In this paper we prove weak consistency of some of these modifications under the assumption that both n and p_n as well as p_{0n} go to infinity.

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