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A Consistency Property of AIC for Multivariate Linear Models when the Dimension and the Sample Size are Large

It is common knowledge that Akaike’s information criterion (AIC) is not consistent in the model selection. This fact has been confirmed from an asymptotic selection-probability based on a large-sample asymptotic framework. However, we note that when a high-dimensional asymptotic framework such that the dimension and the sample size are large is used for evaluating a selection-probability, a consistency property of AIC for selecting variables in multivariate linear models can be proved. This means that a selection-probability of selecting the true model by AIC goes to 1 as the sample size and the dimension are approaching to infinity simultaneously.