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On asymptotic expansion of posterior distribution

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Abstract

© 2016, Pleiades Publishing, Ltd.The paper suggests a new asymptotic expansion of posterior distribution, which improves the known normal asymptotic. The main difference from the previous works on this subject is that the suggested expansion is calculated for the deviation from the true parameter value and not from the value of the maximum likelihood estimator, as it has been done before. This setting is more appropriate for Bayesian and d-posterior [1] approaches to a statistical inference problem. The new expansion can be derived under weaker assumptions than the previously known. Moreover, an asymptotic expansion for the moments of posterior distribution is also presented. The accuracy of the expansion is tested on binomial model with beta prior and results are compared to the Johnson's expansion [2].

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Keywords

asymptotic expansion, Bayesian analysis, posterior distribution