



# Comparing composite likelihood methods based on pairs for spatial Gaussian random fields

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In the last years there has been a growing interest in proposing methods for estimating covariance functions for geostatistical data. Among these, maximum likelihood estimators have nice features when we deal with a Gaussian model. However maximum likelihood becomes impractical when the number of observations is very large. In this work we review some solutions and we contrast them in terms of loss of statistical efficiency and computational burden. Specifically we focus on three types of weighted composite likelihood functions based on pairs and we compare them with the method of covariance tapering. Asymptotics properties of the three estimation methods are derived. We illustrate the effectiveness of the methods through theoretical examples, simulation experiments and by analysing a data set on yearly total precipitation anomalies at weather stations in the United States.

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