

ON FIXED-DOMAIN ASYMPTOTICS AND COVARIANCE TAPERING IN GAUSSIAN RANDOM FIELD MODELS

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Gaussian random fields are commonly used as models for spatial processes and maximum likelihood is a preferred method of choice for estimating the covariance parameters. However if the sample size n is large, evaluating the likelihood can be a numerical challenge. Covariance tapering is a way of approximating the covariance function with a taper (usually a compactly supported function) so that the computational burden is reduced. This talk focuses on the fixed-domain asymptotic behavior of the tapered MLE for the microergodic parameter of a Matérn covariance function when the taper support is allowed to shrink as $n \rightarrow \infty$. In particular if the dimension of the underlying space is ≤ 3 , conditions are established in which the tapered MLE is strongly consistent and also asymptotically normal.