



Kernel methods for estimating anisotropic parameters by means of the covariance tensor identity

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In this paper we consider the problem of estimating the dependence structure of spatial processes under the assumption of anisotropy. We consider a kernel-based method for estimating the anisotropic parameters by using the covariance tensor identity (CTI) introduced by Hristopulos (2002). The CTI method avoids multiple variogram calculations in arbitrary directions and employs relations between the stochastic averages of the gradient tensor and the respective derivatives of the covariance function. We introduce new estimators and study their convergence rates. The efficacy of the approach proposed is demonstrated with synthetic data and tested on a real data set.