Estimation of smoothness of a stationary Gaussian random field

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Abstract

For a stationary Gaussian random field, when the frequency is large, the decay rate of the spectral density determines the smoothness of the process, which is related to the performance of mean-squared prediction. In this talk, we propose an estimator of the decay rate using periodogram when the observations are on a grid and investigate the asymptotic properties under infill setting. An algorithm to reduce bias is developed and a simulation study and a real data example are presented.

Keywords: stationary, Gaussian random field, smoothness, periodogram, infill