MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

Chae Young Lim

Department of Statistics and Probability
Michigan State University

Estimation of Smoothness of a Stationary Gaussian Random Field

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10:20am – 11:10am
Refreshments 10:00am
C405 Wells Hall

Abstract

Analysis on smoothness (or roughness) of time series and spatial data has a wide application in various disciplines. Fractal or Hausdorff dimension is a measure of smoothness and several fractal-based methods are available. For a stationary Gaussian random field, the decay rate of the spectral density as frequency increases is related to the fractal dimension. We propose an estimator of the decay rate using periodogram when the observations are on a grid and investigate its theoretical properties under infill asymptotics. From the property of the estimator we found, we also propose an algorithm to reduce bias. We compare our approach with other existing methods via simulation. Real data example on arctic sea-ice profiles is also presented.

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