

Statistics and Data Science Seminar

Local Times of Gaussian Random Fields

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Abstract: Local times of a Gaussian random field $X = \{X(t), t \in \mathbb{R}^N\}$ with values in $\mathbb{R}^d$ carry a lot of analytic and geometric properties about X . They also arise naturally in the limit distributions of functionals of integrated and fractionally integrated time series or spatial processes, and in nonlinear cointegrating regression.

In this talk, we study the local times of anisotropic Gaussian random fields satisfying strong local nondeterminism with respect to an anisotropic metric. By applying moment estimates for local times, we prove optimal local and global Hölder conditions for the local times for these Gaussian random fields and deduce related sample path properties. These results are closely related to Chung's law of the iterated logarithm and the modulus of nondifferentiability of the Gaussian random fields.

We apply the results to systems of stochastic heat equations with additive Gaussian noise and determine the exact Hausdorff measure function for the level sets of the solution.

This talk is based on a joint paper with Davar Khoshnevisan and Cheuk Yin Lee.

Wednesday, April 19 at 4:00 PM in 636 SEO
