The University of Mississippi
Department of Mathematics

Statistics Seminar

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Title: On the Excursion Probabilities of Gaussian Random Fields

2:00 pm, Thursday, October 23, 2014
Hume Hall 321

Abstract:

Excursion probabilities of Gaussian random fields have many applications in statistics (e.g., scanning statistic and control of false discovery rate (FDR)) and in other areas. In this talk, we consider the excursion probabilities of two types of multivariate Gaussian random fields: those with smooth sample functions, and those with non-smooth (or fractal) sample functions. An important class of such random fields are those with Matérn cross-covariance functions studied by Gneiting, Kleiber, and Schlather (2010). For smooth Gaussian random fields, it is shown that the "Expected Euler Characteristic Heuristic" still holds; and non-smooth Gaussian random fields, we prove an asymptotic result which extends those of Pickands (1969), Piterbarg (1996) and Piterbarg and Stamatovich (2005). The methods for establish these two types of results are very different. This talk is based on joint works with Dan Cheng and Yuzhen Zhou.