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# Limit theorems for $p$ -domain functionals of stationary Gaussian random fields: an introduction



## Abstract:

The topic of the talk is the asymptotic behaviour of the  $p$ -domain functionals of stationary Gaussian random fields. Ideally, we continue the investigation started during the “BiLux 2023 PhD seminar” and answer some of the questions raised there.

To be accessible to a non-specialist audience, at first we give a naive introduction to the field of studies around stationary Gaussian fields and their functionals, giving some tools from Malliavin-Stein method and stating Breuer-Major theorem: a cornerstone in the understanding of the asymptotic behaviour of our objects of interest. Finally, by making further assumptions on the form of the covariance of the underlying Gaussian field, we will show how the asymptotic behaviour of  $p$ -domain functionals can be simply obtained from that of 1-domain functionals, explaining in a new light and in a more systematic way some results from the recent literature.

The talk is based on the work “Limit theorems for  $p$ -domain functionals of stationary Gaussian fields”, with N. Leonenko, L. Maini and I. Nourdin.

Keywords:

Central limit theorem · stationary Gaussian fields · long-range dependence;  
Malliavin-Stein method · Hermite rank ·  $p$ -domain functional

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*"Obvious" is the most dangerous word in mathematics.  
(Eric Temple Bell)*