Small Deviations for Some Gaussian Chaos

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Abstract:

The small ball probability or small deviation studies the behavior of $\log \mu(x : ||x|| \leq \varepsilon)$ as ε tend to zero for a given measure μ and a norm $\| \cdot \|$ on a Banach space. In the literature, small deviation probabilities of various types are studied and applied to many problems of interest under different names such as small value probabilities, lower tail behavior, two sided boundary crossing probabilities, the first exit probabilities, the asymptotes of Laplace transforms, etc. We will present recent developments for certain family of Gaussian chaos defined by stochastic integrals.

Connections and interplays between Gaussian chaos and Markov processes are viewed through simple examples. Several open problems are offered and they suggest the need to combine Markovian and Gaussian techniques together.

References

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