Small Deviation Probability Estimate via Analytic Methods

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Abstract: Small deviation probability has many applications, including to the Chung's law of iterated logarithm, etc. In this talk, I will introduce some analytic methods that have recently been used by the author and his collaborators in the study of small deviation probabilities of Gaussian processes and Gaussian random fields. These methods include 1) using Hadamard Factorization Theorem to obtain exact forms of certain Laplace Transforms; 2) using Fredholm Theory to estimate eigenvalues of certain covariance operators; 3) using Riesz Product techniques to study sharp lower bounds of the sup norms of certain Gaussian fields.