

Entropic repulsion of Gaussian free field on high-dimensional Sierpiński carpet graphs

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Abstract

Consider the centered Gaussian field on a fractal graph based on a high-dimensional Sierpiński carpet (*e.g.* Menger sponge), whose covariance is the Green's function for simple random walk on the graph. Moreover assume that the field is positive everywhere, *i.e.*, constrained above a hard wall at zero height. In this talk, I will present an exact height formula for the local sample mean of the free field above the hard wall on any transient Sierpiński carpet graph. This result extends previous work for the free field on \mathbb{Z}^d , $d \geq 3$, to the fractal setting. Our proof utilizes the theory of transient regular Dirichlet forms, in conjunction with the relative entropy and conditioning arguments introduced originally by Bolthausen–Deuschel–Zeitouni. Joint work with Baris Ugurcan.