SHARP NOISE STABILITY IN CONTINUUM PERCOLATIONS VIA SPECTRA OF POISSON FUNCTIONALS

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Abstract. In this talk, I will consider sharp noise stability of dynamical critical planer continuum percolation models, such as the Boolean model, which gives birth to a random geometric graph. Such a model has applications in the study of telecommunications networks and coverage optimization to name a few.

We consider the model under the Ornstein-Uhlenbeck (OU) dynamics. A critical planer percolation model is said to be noise stable under the OU dynamics if the *left-right occupied crossings* of large squares of side length L in the model are not sensitive to small noises in the underlying system. We show a sharp transition result : when the amount of noise tends to zero as $L \to \infty$ fast enough, then the model is stable under the noise, while if it doesn't tend to zero fast enough, the model is not stable. The main tool is a notion of spectral point process based on the chaos expansion of the crossing functionals, which parallels the corresponding notion of spectral samples in the discrete setting.

The talk is based of a joint work with Giovanni Peccati and Yogeshwaran Dhandapani.

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