

Extreme values of two-dimensional discrete Gaussian Free Field

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The aim of the minicourse is to present recent results on the behavior of the large extrema of the two-dimensional discrete Gaussian Free Field (DGFF). This includes level sets at “height” proportional to the absolute maximum, a distributional scaling limit of the absolute maximum as well as a limit law for the extremal process associated with the DGFF in scaled-up versions of continuum domains in the plane. The role of (asymptotic) conformal invariance, as well as connections to the so called Liouville Quantum Gravity will be elucidated. Time permitting, I will try to make a link to Kahane’s theory of multiplicative chaos and Mandelbrot’s multiplicative cascades.

Based, in parts, on recent joint work with O. Louidor.

SOME RELEVANT LITERATURE

- M. Biskup and O. Louidor (2016). Extreme local extrema of two-dimensional discrete Gaussian free field. *Commun. Math. Phys.* **345**, no. 1, 271–304
- M. Biskup and O. Louidor (2014). Conformal symmetries in the extremal process of two-dimensional discrete Gaussian Free Field. arXiv:1410.4676.
- M. Biskup and O. Louidor (2015). Full extremal process, cluster law and freezing for two-dimensional discrete Gaussian Free Field. arXiv:1606.00510
- M. Bramson, J. Ding and O. Zeitouni (2016). Convergence in law of the maximum of the two-dimensional discrete Gaussian free field. *Commun. Pure Appl. Math.* **69** 62–123.
- R. Rhodes and V. Vargas (2014). Gaussian multiplicative chaos and applications: a review. *Probab. Surveys* **11**, 315–392.