Cube Root Asymptotics for Hammersley's Model

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The Hammersley model is a last-passage percolation model based on a two-dimensional realisation of a homogeneous Poisson random set. For $\mathbf{x}, \mathbf{y} \in \mathbb{R}^2$, with $\mathbf{x} < \mathbf{y}$ (coordinatewise) the last-passage percolation time between $\mathbf{x}$ and $\mathbf{y}$ is defined as the maximal length among all increasing sequences of Poisson points lying within $(\mathbf{x}, \mathbf{y}]$. In this mini-course we will study the behaviour of the fluctuations of the model, and the goal is to show how basic coupling ideas can be use to deduce tightness of the fluctuations in the cube root scale.

The mini course is organised as follows.

Lecture 1. Introduction, the shape theorem and the exit point formula.

Lecture 2. Tightness of fluctuations in the cube root scale.

Lecture 3. Local fluctuations of the limiting process.

Main References

1. E. Cator and P. Groeneboom. *Second Class Particles and the Cube Root Asymptotics for Hammersley's Process.* Ann. of Probab. (2006) Vol. 34, No. 4, 1273–1295.

2. E. Cator and L. P. R. Pimentel. *On the Local Fluctuations of Last-Passage Percolation Models.* Stoch. Proc. Appl. (2015) Vol. 125, No 2, 538–551.