

The van den Berg-Kesten inequality in polymer models

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The van den Berg-Kesten (BK) inequality is a crucial tool in classical percolation theory that shows that disjoint events induce negative conditionings on each other. The inequality also holds in the context of last passage percolation (LPP). These LPP models are connected to line ensembles, where the first curve records the LPP values and the second curve records the increase obtained by considering the maximum weight of pairs of disjoint paths. Recently, an analog of the BK inequality was discovered in the context of zero temperature line ensembles, relating the behavior of the second curve conditional on the first to an unconditioned copy of the first, and this proved to be quite useful in applications. A natural question is to establish this inequality in the positive temperature KPZ line ensemble. However, the earlier proofs do not directly generalize, and it is not even clear if the obvious generalization holds. In this talk we will discuss a version of the BK inequality for the KPZ line ensemble and the continuum directed random polymer, as well as a prelimiting version in the log gamma polymer.