
RIDDHIPRATIM BASU, International Centre for Theoretical Sciences, Tata Institute of Fundamental Research, India
Coalescing Polymers and the Slow Bond Problem

Last passage percolation on \mathbb{Z}^2 with independent exponentially distributed passage times with a common mean is one of the paradigm examples of exactly solvable models in the KPZ universality class. One can study the geometry of polymers in this model by combining the moderate deviation estimates for polymer weights that are available from the integrable probability literature together with techniques of percolation. I shall discuss some recent results in this vein.

We shall consider two polymers to (n, n) from (say) $(k, -k)$ and $(-k, k)$ (with $n \gg k$) and show that they typically coalesce within distance $O(k^{3/2})$ of the origin. As an application beyond the exactly solvable regime, we shall discuss how this result, together with the well-known mapping between exponential last passage percolation and Totally Asymmetric Simple Exclusion Process (TASEP) on \mathbb{Z} , can be used to obtain a characterization of the invariant measures of TASEP on the line with a slow bond at the origin, verifying conjectures by Janowsky and Lebowitz and also of Liggett.

This is based on joint works with Sourav Sarkar, Vladas Sidoravicius and Allan Sly.