

Integrability of Conformal Loop Ensemble: Imaginary DOZZ Formula and Beyond

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The scaling limit of the probability that n points are on the same cluster for 2D critical percolation is believed to be governed by a conformal field theory (*CFT*). Although this is not fully understood, Delfino and Viti made a remarkable prediction on the exact value of a properly normalized three-point probability from the exact S -matrix. It is expressed in terms of the imaginary *DOZZ* formula. Later, similar conjectures were made for scaling limits of random cluster models and $O(n)$ loop models, combining both integrable structure of discrete model as well as the bootstrap hypothesis, representing certain three-point observables in terms of the imaginary *DOZZ* formula and its variants. Since the scaling limits of these models can be described by the conformal loop ensemble (*CLE*), such conjectures can be formulated as exact statements on *CLE* observables. This talk explains the derivation of the above three-point functions via Liouville quantum gravity.

This is based on the joint work with Morris Ang (UC San Diego), Gefei Cai (BICMR), and Xin Sun (BICMR).

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