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Critical Ising model on infinite random triangulation of the half-plane

We consider the Boltzmann random triangulation of a polygon coupled to Ising model with Dobrushin boundary conditions, which can be viewed as a discrete model of Liouville quantum gravity with matter. We derive an explicit expression of the partition function of the finite triangulations at the critical point. Especially we find an asymptotic perimeter exponent different from the one of the pure gravity universality class. Moreover, we show that the local limit of the Boltzmann Ising-triangulations exists in the sense of Benjamini-Schramm as the boundary size tends to infinity one segment after another, which by using a peeling process can be characterized as an explicit Ising-decorated infinite random triangulation. We also show that the infinite component of the interface only touches the boundary a finite number of times as the boundary size tends to infinity. Scaling limits of the perimeter fluctuations associated with the peeling process as well as the size of the interface are also obtained. This is a joint work with Linxiao Chen (University of Helsinki).