YVAN SAINT-AUBIN, Université de Montréal, CP 6128 Centre-ville, Montréal
Critical exponents for the homotopy of Fortuin–Kasteleyn clusters on a torus

We study the critical behavior of statistical lattice models in 2d using the homotopy of their Fortuin–Kasteleyn (FK) cluster. A FK cluster on a torus is said to be of type $\{a, b\}$, $a, b \in \mathbb{Z}$, if it possible to draw a curve belonging to the cluster that winds a times around the first cycle of the torus as it winds $-b$ times around the second. Even though the Q-Potts models make sense only for Q integers, they can be included into a family of models parametrized by $\beta = \sqrt{Q}$ for which the FK clusters can be defined for any real $\beta \in (0, 2]$. For this family, we study the probability $\pi(\{a, b\})$ of a given type of clusters as a function of the torus modular parameter $\tau = \tau_r + i\tau_i$. We compute the asymptotic behavior of some of these probabilities as the torus becomes infinitely thin. Exponents describing these behaviors are defined and related to weights $h_{r,s}$ of the extended Kac table for r, s integers, but also half-integers. Numerical simulations are also presented.

Joint work with Alexi Morin-Duchesne.