

Computation of the critical point for the random-cluster model on \mathbb{Z}^2 via parafermionic observables.

The random-cluster model (or Fortuin-Kasteleyn percolation) plays a key role in studies of models on lattices, as it is connected to many of them, and the results obtained for random-cluster model can be then applied for other models. In this talk I will present another proof of the well-known fact that for the square lattice the critical probability of the random-cluster model p_{cr} is equal to $\frac{\sqrt{q}}{1+\sqrt{q}}$ for q in $[1, 4]$. Unlike other proofs, this one involves the method of parafermionic observables applied to exploration paths in boxes and strips of growing size.

This result was presented in a joint work with E. Mukoseeva during my PhD under the supervision of H. Duminil-Copin.