

# Onedimensional Ising model with ferromagnetic long range interactions: typical configurations in the canonical ensemble

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In this talk I will present the fundamental results in the literature on community detection for the Stochastic Block Model (SBM) with  $k$  communities, not necessarily symmetrical (all communities of the same size), focusing mainly on the method of maximum likelihood. This approach was previously considered by Chen and Bickel (2009). However, the proof of the consistency of the maximum likelihood estimator presents some points that are still open and not fully justified, as pointed out by Van der Pas and van der Vaart (2018). In this work, we show, using different concentration inequalities, that the maximum likelihood estimator is consistent above the phase transition threshold for networks with a logarithmic degree regime, completing the proof of Chen and Bickel (2009) and generalizing their results. This is joint work with Andressa Cerqueira (UFSCAR).