

Renyi Entropy of the Totally Asymmetric Exclusion Process

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Abstract:

The Renyi entropy is a generalisation of the Gibbs-Shannon entropy. I'll discuss its definition and status. I will present results for the Renyi entropy of the totally asymmetric exclusion process (TASEP). To do so we calculate explicitly the sum of squares of configuration probabilities, using the matrix product formalism to map the problem to one involving a six direction lattice walk in the upper quarter plane with absorbing boundary conditions. We derive the generating function across the whole phase diagram, using an obstinate kernel method. This gives the leading behaviour of the Renyi entropy and corrections in all phases of the TASEP.