



Quantum Adiabatic Optimization and Combinatorial Landscapes

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BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 32 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. In this paper we analyze the performance of the Quantum Adiabatic Evolution (QAE) algorithm on a variant of Satisfiability problem for an ensemble of random graphs parametrized by the ratio of clauses to variables, γ . We introduce a set of macroscopic parameters (landscapes) and put forward an ansatz of universality for random bit flips. We then formulate the problem of finding the smallest eigenvalue and the excitation gap as a statistical mechanics problem. We use the so-called annealing approximation with a refinement that a finite set of macroscopic variables (verses only energy) is used, and are able to show the existence of a dynamic threshold γ_{th} , beyond which QAE should take an exponentially long time to find a solution. We compare the results for extended and simplified sets of landscapes and provide numerical evidence in support of our universality ansatz. This item ships from La Vergne, TN. Paperback.



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