

Abstract Submitted  
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**Period Finding with Adiabatic Quantum Computation** ITAY HEN,  
Information Sciences Institute, USC — We outline an efficient quantum-adiabatic algorithm that solves Simon’s problem, in which one has to determine the “period,” or xor-mask, of a given black-box function. We show that the proposed algorithm is exponentially faster than its classical counterpart and has the same complexity as the corresponding circuit-based algorithm. Together with other related studies, this result supports a conjecture that the complexity of adiabatic quantum computation is equivalent to the circuit-based computational model in a stronger sense than the well-known, proven polynomial equivalence between the two paradigms. We also discuss the importance of the algorithm and its implications for the existence of an optimal-complexity adiabatic version of Shor’s integer factorization algorithm and the experimental implementation of the latter.

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