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ACCEPTED MANUSCRIPT

Perspectives of quantum annealing: Methods and implementations

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Abstract

Quantum annealing is a computing paradigm that has the ambitious goal of efficiently solving large-scale combinatorial optimization problems of practical importance. However, many challenges have yet to be overcome before this goal can be reached. This perspectives article first gives a brief introduction to the concept of quantum annealing, and then highlights new pathways that may clear the way towards feasible and large scale quantum annealing. Moreover, since this field of research is to a strong degree driven by a synergy between experiment and theory, we discuss both in this work. An important focus in this article is on future perspectives, which complements other review articles, and which we hope will motivate further research.

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