Preface

A quantum computer is a computer that exploits quantum mechanical phenomena. On small scales, physical matter exhibits properties of both particles and waves, and quantum computing takes advantage of this behavior using specialized hardware. Classical physics cannot explain the operation of these quantum devices, and a scalable quantum computer could perform some calculations exponentially faster[a] than any modern "classical" computer. Theoretically a large-scale quantum computer could break some widely used encryption schemes and aid physicists in performing physical simulations; however, the current state of the art is largely experimental and impractical, with several obstacles to useful applications.[1]

In the present book, ten typical literatures about Quantum computing research published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on Quantum computing research. We hope this book can demonstrate advances in Quantum computing research as well as give references to the researchers, students and other related people.

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[1] https://en.wikipedia.org/wiki/Quantum_computing