

CP-03-03

Beyond-classical quantum computing with superconducting circuits

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Abstract

Quantum computers have the potential to solve problems that are intractable for classical computers. However, achieving such beyond-classical performance has been an outstanding challenge, requiring the development of quantum algorithms and capable hardware systems. I will give an overview on the research in the Google Quantum AI team in this area. I will discuss the technical advancements in our quantum hardware, which enabled the recent beyond-classical random circuit sampling result and its underlying physical mechanisms. I will conclude the talk by discussing the challenges and promises associated with measuring physical local observable in the beyond-classical regime.