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The Quest of Quantum Advantage with a Hybrid Photonics Platform

Thursday, 4 May 2023 09:00 (1 hour)

Boson sampling is a computational problem that has been proposed as a candidate to obtain an unequivocal quantum computational advantage. The problem consists in sampling from the output distribution of indistinguishable bosons in a linear interferometer. There is strong evidence that such an experiment is hard to classically simulate, but it is naturally solved by dedicated photonic quantum hardware, comprising single photons, linear evolution, and photodetection. This prospect has stimulated much effort resulting in the experimental implementation of progressively larger devices. We will review recent advances in photonic boson sampling, describing both the technological improvements achieved and the future challenges. We will discuss recent proposals and implementations of variants of the original problem based on hybrid photonics platform.

Abstract category

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