Design and implementation of a photonic quantum storage device

IBM THINKQ Conference
Yorktown Heights, NY
December 6-8, 2017

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Abstract

We discuss the design and implementation of a "Qubit Trap", which is a feedback-based photonic quantum structure. The main advantages and difficulties of using photons as a qubit information carrier are discussed, along with some of the circuitry designed to address these issues. In addition, we discuss the advantage of using feedback-path controls (as opposed to more standard feedforward controls) in order to optimize and stabilize the photonic path. Finally, we will consider the advantages of using photonics from the dual perspectives of device operation and manufacturing scalability.