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Spacetime Replication of Quantum Information Using $(2, 3)$ **Quantum Secret Sharing and Teleportation**[1] YADONG WU, ABDULLAH KHALID, MASOUD DAVIJANI, BARRY SANDERS, University of Calgary — The aim of this work is to construct a protocol to replicate quantum information in any valid configuration of causal diamonds and assess resources required to physically realize spacetime replication. We present a set of codes to replicate quantum information along with a scheme to realize these codes using continuous-variable quantum optics. We use our proposed experimental realizations to determine upper bounds on the quantum and classical resources required to simulate spacetime replication. For four causal diamonds, our implementation scheme is more efficient than the one proposed previously. Our codes are designed using a decomposition algorithm for complete directed graphs, $(2, 3)$ quantum secret sharing, quantum teleportation and entanglement swapping. These results show the simulation of spacetime replication of quantum information is feasible with existing experimental methods.

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