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Quantum secret sharing with graph states

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Secret sharing is an information processing protocol for managing secret information over multiple parties. The information is distributed in a way that some subset of the parties referred to as the access structure can collaborate to recover the original secret information, but all other subsets of parties referred to as adversary structure gain no information on the secret even with unlimited computing power. The parties in secret sharing forms a quantum network connected by the optical channels. In our work, we use the graph states formalism to represent the distribution of entangled states in a secret sharing protocol whereby the communicating parties correspond to the vertices and the optical channels linking them represent the edges. We also demonstrate the use of quantum repeaters which links the dealer and the players in our secret sharing scheme to address the problems associated with the imperfections in the generation of the entangled states, as well as noise and loss effects during the transfer of the states over communication network.

Apply to be
 considered for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

PhD

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