

Threshold Quantum Distillation

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Abstract : Quantum distillation is the task of concentrating quantum correlations present in N imperfect copies to M perfect copies ($M < N$) using free operations by involving all P the parties sharing the quantum correlation. We present a threshold quantum distillation task where the same objective is achieved but using lesser number of parties ($K < P$). In particular, we give an exact local filtering operations by the participating parties sharing high dimension multipartite entangled state to distill the perfect quantum correlation. Later, we bridge a connection between threshold quantum entanglement distillation and quantum steering distillation and show that threshold distillation might work in the scenario where general distillation protocol like DEJMPS does not work.

Keywords : quantum networks, quantum distillation, quantum key distribution, entanglement distillation

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