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Characterization and optimization of quantum repeater networks

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Abstract

Very recently we have seen the first proof of principle demonstrations of entanglement-based quantum networks. However, many challenges remain to scale these demonstrations. Here, I will discuss several ideas for optimizing the performance of near-term networks. First, I will introduce tools for efficiently evaluating the performance of quantum networks and show how these tools can be leveraged for implementing quantum key distribution over a very noisy chain of quantum repeaters. Then, I will discuss some ideas for efficient entanglement characterization as a byproduct of entanglement distillation.