



Analysing information back-flow in measurement-free teleportation

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Quantum teleportation demonstrates entanglement's power as a resource: jointly measuring the quantum states of two particles enables sending a quantum state to another particle without a quantum channel. While typically associated with long-distance quantum communication, its relevance to quantum computation is significant. The measurement-free teleportation protocol, known as the BBC protocol, was specifically designed for this purpose. Rather than introducing non-Markovianity through an external environment, in this talk I will analyze its potential inherent presence in the protocol. Despite previous studies linking non-Markovianity to teleportation, such analysis aims to explore the dynamics and correlations within the protocol itself, revealing surprising challenges in connecting the two.

