



TEXAS TECH™

Quantum Information and Computing (QIC)
Seminar

Zhi Li (Perimeter Institute)

3:30 PM, Tuesday, April 1, 2025 on Zoom

Tripartite Haar random state has no bipartite entanglement

We show that no EPR-like bipartite entanglement can be distilled from a tripartite Haar random state by local unitaries or local operations when each subsystem has fewer than half of the total qubits. Specifically, we derive an upper bound on the probability of sampling a state with EPR-like entanglement for a given EPR fidelity tolerance, showing a doubly-exponential suppression in the number of qubits. Viewing the tripartite state as a bipartite quantum error-correcting code, this also implies that each output subsystem does not support any logical operator. We also discuss a

physical interpretation in the AdS/CFT correspondence, indicating that a connected entanglement wedge does not necessarily imply bipartite entanglement as opposed to a previous belief. This talk is based on joint work in preparation with Takato Mori and Beni Yoshida.

Zoom link:

<https://texastech.zoom.us/j/91705448152?pwd=ozg9fEfEhgFgHkmaJARhgoRRWXqYvI.1>

Meeting ID: 917 0544 8152

Passcode: QIC2025
