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Towards entanglement purification in circuit QED C S WANG, J Z BLUMOFF, K CHOU, P REINHOLD, L FRUNZIO, M H DEVORET, L JIANG, R J SCHOELKOPF, Yale University — An attractive approach toward scaling a quantum computer is the modular architecture, where isolated registers containing a few well-controlled degrees of freedom are connected through a limited number of quantum links. These links enable gates between registers via teleportation, a protocol which requires an inter-register entangled pair as a resource. If these links are of lower quality, we can still create a high-fidelity entangled pair by utilizing entanglement purification. We will discuss our implementation for purification of entanglement between qubits encoded in the state of two non-interacting superconducting cavities. In this talk, we describe the experimental protocol and report our results toward realizing such a scheme.

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