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Entangled Schrodinger cats in circuit QED: Joint Wigner Tomography YVONNE Y GAO, CHEN WANG, PHILIP REINHOLD, REINIER W HEERES, NISSIM OFEK, KEVIN CHOU, CHRISTOPHER AXLINE, LUIGI FRUNZIO, MICHEL H DEVORET, ROBERT J. SCHOELKOPF, Yale University
— Creating and controlling entanglement of quantum states over large Hilbert space is an important element of quantum information processing. Using the cQED architecture consisting of two long-lived superconducting cavities dispersively coupled to a transmon qubit, we successfully created an entangled coherent-state microwave fields in two superconducting cavities. In this talk, we will present the full joint Wigner tomography of the state, measured using the method of joint photon number parity measurement introduced in the previous talk. Furthermore, we will show the redundant encoding and efficient read-out of two logical bits of information in such entangled state and hence demonstrating that the entangled "Schrodinger cats" is a viable candidate as an error-correctable quantum memory as well as a valuable platform for implementation of two-qubit logical operations.

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