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Dissipative coherence of a superconducting qubit for microwave detection[1] SATCHER HSIEH, KATER MURCH, Washington University — Recent progress in coherent control and measurement of superconducting qubits has opened avenues to previously inaccessible regimes of metrology. Here we realize a detection scheme for microwave signals. Our scheme utilizes a superconducting transmon qubit coupled to a three-dimensional cavity. When subjected to a weak drive signal near resonance, the qubit equilibrates to a steady state coherence that arises from the competition between driven and dissipative dynamics. By measuring this steady state coherence with quantum state tomography, we map the quantum state to characteristics of the drive signal with shot noise-limited resolution. We report detection figures of merit and discuss applications to itinerant microwave fields.

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