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Observation of Autler-Townes effect in a dispersively dressed Jaynes-Cummings System B. SURI, Z.K. KEANE, Dept. of Physics, Univ. of Maryland, College Park, MD20742, Laboratory for Physical Sciences, College Park, MD 20740, R. RUSKOV, Laboratory for Physical Sciences, College Park, MD 20740, LEV S. BISHOP, Joint Quantum Institute, Condensed Matter Theory Center, Dept. of Physics, Univ of Maryland, College Park, MD 20742, C. TAHAN, Laboratory for Physical Sciences, College Park, MD 20740, S. NOVIKOV, Dept. of Physics, Univ. of Maryland, College Park, MD20742, Laboratory for Physical Sciences, College Park, MD 20740, J.E. ROBINSON, Laboratory for Physical Sciences, College Park, MD 20740, F.C. WELLSTOOD, Joint Quantum Institute, Center for Nanophysics and Advanced Materials, Dept. of Physics, Univ of Maryland, College Park, MD 20742, B.S. PALMER, Laboratory for Physical Sciences, College Park, MD 20740, Dept. of Physics, Univ of Maryland, College Park, MD 20742 — We report on the spectrum of a superconducting Al/AlOx/Al transmon qubit coupled to a planar superconducting resonator in the strong dispersive limit. We resolve discrete peaks in the transition spectrum, each corresponding to a different number of photons. At a base temperature of 30 mK and in the absence of a coherent drive on the resonator, we find a weak n = 1 photon peak along with the n = 0 photon peak in the qubit spectrum, corresponding to a population of 5.474 GHz photons at an effective resonator temperature of T = 120mK. Two-tone spectroscopy using independent coupler and probe tones reveals an Autler-Townes splitting in the thermal n = 1 photon peak. The observed effect is explained accurately using the four lowest levels of the dispersively dressed qubit-resonator system and compared to results from numerical simulations of the steady-state master equation for the coupled system.

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