

Cavity Quantum Electrodynamics with the Dressed States of a Superconducting Artificial Atom

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We experimentally studied the microwave response of a transmon artificial atom coupled to a coplanar waveguide resonator. The resonator shows two closely split resonance modes, which are respectively used as control mode and probe mode. The atom is driven off-resonance by the control mode to form dressed states, which is in resonance with the probe mode. Dressed states produced by the multi-photon processes can be seen in this scheme. The probe microwave transmission as a function of driving amplitude obeys the Bessel functions up to the second order. Our device may find its application in the electro-optical modulation at microwave frequencies.