

Abstract Submitted
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Requirements for Electromagnetically Induced Transparency in a Transmon J.E. ROBINSON, Laboratory for Physical Sciences, College Park, MD, S. NOVIKOV, Z.K. KEANE, B. SURI, Department of Physics, University of Maryland and Laboratory for Physical Sciences, College Park, MD, F.C. WELLSTOOD, Department of Physics, University of Maryland, College Park, MD, B.S. PALMER, Laboratory for Physical Sciences, College Park, MD — In the dressed atom picture, a three-level system can interact with two photons via the Autler-Townes (AT) effect, where the system exhibits two peaks separated by the generalized Rabi frequency of the coupling photon. The system can also exhibit electromagnetically induced transparency (EIT), where the first excited state is made transparent to the probe photon by a strong coupling drive. We examine the results from a multi-tone measurement in a transmon qubit coupled to a 3D cavity, which exhibits an AT splitting, as expected from the dressed atom picture, similar to previous results.^{1,2} We will discuss the requirements for a crossover from an AT doublet to an EIT signal, as they relate to the limitations of our device. We will also examine the quantum information implications of realizing EIT in superconducting system.

¹M. Baur, et al. *Phys. Rev. Lett.* **102**, 243602 (2009).

²Mika A. Sillanpää, et al. *Phys. Rev. Lett.* **103**, 193601 (2009).

Jennifer E. Robinson
Laboratory for Physical Sciences, College Park, MD

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