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Probing Electromagnetically Induced Transparency in a Transmon SERGEY NOVIKOV, Dept. of Physics, University of Maryland, J.E. ROBINSON, Laboratory for Physical Sciences, Z.K. KEANE, Dept. of Physics, University of Maryland, Laboratory for Physical Sciences, B. SURI, Dept. of Physics, University of Maryland, F.C. WELLSTOOD, JQI, CNAM, Dept. of Physics, University of Maryland, B.S. PALMER, Laboratory for Physical Sciences — We have designed, fabricated, and measured a transmon made from a single Al/AlOx/Al Josephson-Junction on a sapphire substrate with $f_{01} \sim 5$ GHz. The transmon was mounted in a 3D microwave cavity (OFHC copper, $f_c \sim 7.5$GHz), similar to other recent experiments[1,2]. The observed coherence times were $T_1, T_2^* \sim 10\mu$s allowing us to investigate the possibility of electromagnetically induced transparency (EIT) and other population trapping effects, such as the Autler-Townes (AT) splitting. We will discuss the experiments to look for and distinguish between AT and EIT given the constraints placed by the transmon and the readout limitations imposed by the cavity.

[1]Paik, H. *et al.* Phys. Rev. Lett. 107, 240501.
[2]Rigetti, C. *et al.* Phys. Rev. B 86, 100506.

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