

Abstract Submitted
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Electromagnetically Induced Superluminal Light in a 3D Transmon Device TIMOTHY M. SWEENEY, Lab. for Physical Sciences, SERGEY NOVIKOV, BALADITYA SURI, SHAVINDRA PREMARANTE, JEN-HAO YEH, Dept. of Physics, Univ. of Maryland, F.C. WELLSTOOD, JQI, CNAM, Dept. of Physics, Univ. of Maryland, B.S. PALMER, Lab. for Physical Sciences — Quantum interference in a three level Λ -type system can result in non-linear optical effects such as electromagnetically induced transparency/absorption (EIT/EIA), slow, and fast light. We have created a Λ system with an effectively metastable state by dispersively coupling an Al/AlOx/Al transmon qubit ($T_1 = 4$ us) to a 3D Cu microwave cavity ($T_1 = 340$ ns). By probing the transmission through the cavity while pumping a qubit-cavity sideband yields a large change in the dispersion. We observe group advances of up to 10 us for Gaussian pulses propagating through the system, corresponding to a group index of -176,000.

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