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Electromagnetically induced transparency in a tunable three-dimensional transmon[1] TIEFU LI, QICHUN LIU, Institute of Microelectronics, Tsinghua University, XIAOQING LUO, Beijing Computational Science Research Center, HU ZHAO, Institute of Microelectronics, Tsinghua University, WEI XIONG, ZHEN CHEN, Beijing Computational Science Research Center, YING-SHAN ZHANG, J. S. LIU, WEI CHEN, Institute of Microelectronics, Tsinghua University, FRANCO NORI, Center for Emergent Matter Science (CEMS), RIKEN, J. S. TSAI, Department of Physics, Tokyo University of Science, J. Q. YOU, Beijing Computational Science Research Center — Electromagnetically induced transparency (EIT) has been realized in atomic systems, but fulfilling the EIT conditions for artificial atoms made from superconducting circuits is a more difficult task. Here we report an experimental observation of the EIT in a tunable three-dimensional transmon by probing the cavity transmission. We tune the transmon to adjust its damping rates to fulfill the EIT conditions. From the experimental observations, we clearly identify the EIT and Autler-Townes splitting (ATS) regimes as well as the transition regime in between. Also, the experimental data demonstrate that the threshold \Omega_{AIC}determined by the Akaike information criterion can describe the EIT-ATS transition better than the threshold \Omega_{EIT}given by the EIT theory.

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