Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Single-photon driven high-order sideband transitions in an ultrastrongly coupled circuit quantum electrodynamics system[1] TIEFU LI, Tsinghua University, ZHEN CHEN, YIMIN WANG, Beijing Computational Science Research Center, LIN TIAN, University of California, Merced, YUEYIN QIU, Beijing Computational Science Research Center, KUNIHIRO INOMATA, FUMIKI YOSHIHARA, Institute of Physical and Chemical Research(RIKEN), SIYUAN HAN, University of Kansas, FRANCO NORI, Institute of Physical and Chemical Research(RIKEN), JAW-SHEN TSAI, Tokyo University of Science, J. Q. YOU, Beijing Computational Science Research Center — We report the experimental observation of high-order sideband transitions at the single-photon level in a quantum circuit system of a flux qubit ultrastrongly coupled to a coplanar waveguide resonator. With the coupling strength reaching 10% of the resonator's fundamental frequency, we obtain clear signatures of higher-order red- and first-order blue-sideband transitions. These transitions are owing to the ultrastrong Rabi coupling, instead of the driving power. Our observation advances the understanding of ultrastrongly-coupled systems and paves the way to study high-order processes in the quantum Rabi model.

[1]This work is supported by the National Basic Research Program of China and the National Natural Science Foundation of China.

Zhen Chen
Beijing Computational Science Research Center

Date submitted: 04 Nov 2016 Electronic form version 1.4