Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Deterministic amplification for cat-state engineering in circuit-QED JAEWOO JOO, ATI and Physics Department, Univ of Surrey, DANIEL OI, Physics Department, University of Strathclyde, MATTHEW ELLIOTT, ERAN GINOSSAR, ATI and Physics Department, Univ of Surrey, TIMOTHY SPILLER, York Centre for Quantum Technologies, Department of Physics, University of York
— We propose a novel implementation scheme of amplifying the size of Schroedinger cat states in superconducting circuits. While the amplification method in quantum optics is normally probabilistic, our scheme can be performed deterministically in circuit-QED. Using adiabatic methods and optimal control, we demonstrate that the amplification operation can be built deterministically in a system of a transmon qubit strongly coupled with a cavity. This amplification tool will in particular open the potential of continuous-variable nonclassical states toward practical quantum technologies, for example, stabilization of cat-type states and continuous-variable teleportation.

Jaewoo Joo
Univ of Surrey

Date submitted: 14 Nov 2014 Electronic form version 1.4