Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Quantum Interference Induced by Landau-Zener Transition in Strongly Driven Flux Qubits YANG YU, YIWEN WANG, XUEDA WEN, National Laboratory of Solid State Microstructures, Department of Physics, Nanjing University, Nanjing 210093, China, GUOZHU SUN, SHANHUA CONG, JIAN CHEN, LIN KANG, WEIWEI XU, PEIHENG WU, Research Institute of Superconductor Electronics, Department of Electronic Science and Engineering, Nanjing University, Nanjing 210093, China, SIYUAN HAN, Department of Physics and Astronomy, University of Kansas, Lawrence, KS 66045, USA — We irradiate superconducting flux qubits with strong microwaves. Quantum interference patterns corresponding to the population transitions between discrete macroscopic quantum states were observed. The interference patterns, which depend on the microwave frequency and power, are complicated because of the short decoherence time. An analytical model based on Landau-Zener transition is developed to quantitatively describe the interference patterns. This work is partially supported by NSFC (10704034, 10725415), the State Key Program for Basic Research of China (2006CB921801).

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Date submitted: 17 Nov 2009 Electronic form version 1.4