Weekly Seminar

Catch and release of microwave photons

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Time: 4:00pm, May. 7, 2014 (Wednesday)
时间：2014年5月7日（周三）下午4:00
Venue: Room 607, Science Building 5
地点：理科五号楼607会议室

Abstract

Quantum information is often encoded in photons, which can both propagate freely along transmission lines and be stored in cavity resonators. To store photons efficiently, the resonator should have negligible coupling with the outside world. On the other hand, the resonator should be strongly coupled to a transmission line through which photons can be transmitted and received. These contrary requirements can be resolved with adjustable coupling. We experimentally demonstrate a superconducting resonator with variable coupling to a measurement transmission line. The resonator coupling can be adjusted through zero to a photon emission rate 300 times the intrinsic resonator decay rate. We demonstrate the catch and shaped release of microwave photons as well as the control of nonclassical Fock states. We achieve a high-fidelity catch efficiency (99.4%) for a ``time-reversed" shaped photon. These results will enable high fidelity quantum state transfer between distant cavities. At the end, I will also present the current status of quantum computing with superconducting qubits.

About the Speaker

Yin, Yi received her B.S. degree from USTC in 2002 and Ph.D. from Harvard University in 2009. She worked as a postdoc at University of California, Santa Barbara in 2009-2012. She joined the Physics Department of Zhejiang University in 2012. Dr. Yin is working in the field of low temperature scanning tunneling microscope (STM) and superconducting qubits. Her research interests are using STM to study quantum behavior of strongly correlated materials and applying solid state superconducting qubits to simulate condensed matter physics.