Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Tunable Coupling between Two Resonators Controlled by a Flux Qubit: the Quantum Switch E. HOFFMANN, M. HAEBERLEIN, A. BAUST, M.J. SCHWARZ, E.P. MENZEL, H. HUEBL, F. DEPPE, A. MARX, R. GROSS, TU Muenchen and Walther-Meissner-Institut, Germany, D. ZUECO, CSIC-Universidad de Zaragoza, Spain, J.-J. GARCIA RIPOLL, IFF-CSIC, Madrid, Spain, E. SOLANO, Universidad del Pais Vasco UPV/EHU and Ikerbasque, Spain
— In the field of quantum information processing, superconducting circuits have become a well-established platform. In particular, systems consisting of a few qubits and/or harmonic oscillator circuits have been investigated. When scaling up these systems, it seems practical to aim for active guidance elements allowing for a directed transmission of quantum signals. One way to achieve this is by implementing switchable coupling between two microwave resonators. We show experimental progress on two superconducting transmission line resonators, where a superconducting flux qubit mediates a controllable coupling - the Quantum Switch. We show an experimental characterization of such a device and discuss spectroscopic evidence for the switching behavior.

We acknowledge support from the DFG via SFB 631, the German excellence initiative via NIM, and EU projects CCQED, SOLID and PROMISCE, the Basque Foundation for Science, Basque Government IT472-10, and Spanish MICINN FIS2009-12773-C02-01, DZ granted by ARAID

Alexander Baust
TU Muenchen and Walther-Meissner-Institut, Germany

Date submitted: 20 Dec 2012 Electronic form version 1.4