Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Tunable High Q Superconducting Microwave Resonator[1] Z. KIM, JQI/UMD, C.P. VLAHACOS, CNAM/NASA, J.E. HOFFMAN, J.A. GROVER, JQI/UMD, B.K. COOPER, J.R. ANDERSON, A.J. DRAGT, C.J. LOBB, JQI/CNAM/UMD, L.A. OROZCO, S.L. ROLSTON, JQI/UMD, J.M. TAYLOR, JQI/NIST/UMD, F.C. WELLSTOOD, JQI/CNAM/UMD — We have developed a frequency tuning system for a "lumped-element" thin-film superconducting Nb microwave resonator on sapphire intended for coupling to cold trapped ^{87}Rb atoms. ^{87}Rb has hyperfine ground states, $|^5S_{1/2}, F = 1\rangle$ and $|^5S_{1/2}, F = 2\rangle$, which are separated by about 6.83 GHz and available as a two-level system for a qubit. The resonator consists of a meandering inductor and an interdigitated capacitor coupled to a transmission line. At T=12 mK and on resonance at 6.863 GHz, the loaded quality factor is 40,000. We employ an Al pin as a frequency tuner by placing it above the inductor using a piezo stage so that one can effectively change the inductance of the resonator.

[1]Work supported by NSF through the PFC at JQI.

Zaeill Kim
JQI/UMD

Date submitted: 29 Dec 2010 Electronic form version 1.4