

Dynamical tunable coupling of optimally biased flux qubits

A.O. Niskanen¹, K. Harrabi², F. Yoshihara³, Y. Nakamura^{2,3,4}, S. Lloyd⁵ and J.S. Tsai^{2,3,4}

¹ VTT

² CREST-JST

³ RIKEN

⁴ NEC

⁵ MIT

I will describe how to achieve the tunable coupling of two superconducting qubits without sacrificing quantum coherence in both theory [1] and experiment [2]. I will also describe how to improve the used parametric coupling scheme by several orders of magnitude [3] by optimizing the sample parameters.

References :

[1] A. O. Niskanen, Y. Nakamura, and J.S. Tsai, Phys. Rev. B 73, 094506 (2006).

[2] A. O. Niskanen, K. Harrabi, F. Yoshihara, Y. Nakamura, S. Lloyd, J. S. Tsai, Science 316, 723 (2007).

[3] S. Ashhab, A. O. Niskanen, K. Harrabi, Y. Nakamura, T. Picot, P. de Groot, C. J. P. M. Harmans, J. E. Mooij, and F. Nori, arXiv :0709.0237.