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Single microwave photon source using circuit QED ALEXANDRE BLAIS, Universite de Sherbroole, JAY GAMBETTA, Yale University, CLIFFORD CHEUNG, Harvard University, ANDREAS WALLRAFF, ETH Zurich, DAVID SCHUSTER, STEVEN GIRVIN, ROBERT SCHOELKOPF, Yale University — In circuit QED, a superconducting charge qubit is fabricated inside a high-quality factor transmission line resonator [1]. This opens the possibility to probe the regime of strong coupling of cavity QED using microwave photons and artificial atoms. This physics was experimentally investigated in the resonant [2] and in the dispersive [3] regime. In this talk, we will show how this setup could be used to generate single microwave photons on demand. Moreover, by using a different circuit QED layout with two resonators, photon generation could be tagged. The possibility to use a similar setup to detect single photons will also be discussed. [1] A. Blais, R.-S. Huang, A. Wallraff, S. M. Girvin and R. J. Schoelkopf, Phys. Rev. A **69**, 062320 (2004). [2] A. Wallraff, D. Schuster, A. Blais, L. Frunzio, R.-S. Huang, J. Majer, S. Kumar, S. M. Girvin and R. J. Schoelkopf, Nature **431**, 162 (2004). [3] D. I. Schuster, A. A. Houck, J. A. Schreier, A. Wallraff, J. M. Gambetta, A. Blais, L. Frunzio, B. Johnson, M. H. Devoret, S. M. Girvin and R. J. Schoelkopf, Cond-mat/0608693.

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