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Unexpectedly allowed transition in two inductively coupled transmons ETIENNE DUMUR, IME, University of Chicago, Grenoble Alps University, Neel Institute, CNRS, BRUNO KUNG, ALEXEY FEOFANOV, THOMAS WEISSL, YURIY KRUPKO, NICOLAS ROCH, CECILE NAUD, WIEBKE GUICHARD, OLIVIER BUISSON, Grenoble Alps University, Neel Institute, CNRS — In a transmon qubit the symmetry of the wave functions prevents the direct zero-two transition to occur due to selection rules. In this talk we will present experimental results on a circuit composed of two inductively coupled transmons[1] in which the unexpected direct zero-two transition is observed[2]. Furthermore this transition shows first a magnetic flux dependence and second a clear disappearance at zero magnetic flux. This effect will be discussed through the finite coupling inductance leading to symmetry breaking at non zero magnetic flux. Recently it has been discussed that such transition could produce measurement-induced state transitions in a transmon qubit[3].
[1] E. Dumur, et al, Phys.Rev. B92, 020515(R) (2015).
[2] E. Dumur, et al, IEEE Trans. On Appl. Supercond. 26, 1700304 (2016).
[3] D. Sank et al, Phys. Rev. Lett. 117, 190503 (2016).

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