

Abstract Submitted
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Quantization of lumped elements electrical circuits revisited

KEVIN LALUMIERE, ALIREZA NAJAFI-YAZDI, Anyon Systems Inc. — In 1995, the Les Houches seminar of Michel Devoret introduced a method to quantize lumped elements electrical circuits [1]. This method has since been formalized using the matrixial formalism, in particular by G. Burkard [2,3]. Starting from these seminal contributions, we present a new algorithm to quantify electrical circuits. This algorithm unites the features of Devoret's and Burkard's approaches. We minimize the set of assumptions made so that the method can treat directly most electrical circuits. This includes circuits with resistances, mutual inductances, voltage and current sources. We conclude with a discussion about the choice of the basis in which the Hamiltonian operator should be written, an issue which is often overlooked. [1] M. H. Devoret, Les Houches, Session LXIII, 1995 [2] G. Burkard et al., Phys. Rev. B, 69, 064503, 2004 [3] F. Solgun, Ph.D. Dissertation, RWTH Aachen, 2015

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