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Blackbox quantization and numerical simulation of a concentric transmon superconducting qubit ALIREZA NAJAFI-YAZDI, KEVIN LALUMIERE, Anyon Systems Inc., J. BRAUMÜLLER, MARTIN WEIDES, KIT — We present a blackbox quantization [1] and numerical study of a planar concentric transmon superconducting qubit. This architecture has been recently proposed and experimentally investigated by Braumüller et al [2]. The device involves a gradiometric SQUID loop for a fast tuning of the qubit transition frequency. This allows for full tomographic control of the quantum circuit. A fully automatized numerical package for quantization of superconducting qubits is developed and used for the study of the concentric transmon. A systematic characterization of loss channels such as Purcell decay and radiative losses are also studied. Numerical results are in close agreement with experimental data and suggest the platform to be a useful tool in the design of superconducting circuits. References: [1] Firat, S., DiVicenzo, D. W., David, P., Physical Review B, Vol. 90, No. 13, pp. 134-504, 2014. [2] J. Braumüller et al., arXiv:1509.08014

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