

Abstract Submitted
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Superconducting 3D Transmon Qubits for Analog Quantum Simulations OSCAR GARGIULO, IQOQI (Institute for Quantum Optic and Quantum Information) , STEFAN OLESCHKO, UIBK (University of Innsbruck), PHANI MUPPALLA, IQOQI (Institute for Quantum Optic and Quantum Information), MARCELLO DALMONTE, ICTP (International Center for Theoretical Physics), PETER ZOLLER, GERHARD KIRCHMAIR, UIBK (University of Innsbruck) — We present an experimental investigation of the tunability of a 3D transmon qubit through the use of multiple magnetic fields. The 3D transmon is placed inside a copper cavity with sockets for coils and a hole for a magnetic hose. The magnetic hose is used to guide the magnetic field inside the cavity minimizing Eddy currents in the copper wall. As a first step we analyse the qubit tuning with static magnetic fields applied through the use of external coils. This allows us to set the qubit frequency to the desired bias point. Then we show that we can switch the magnetic field inside the cavity on fast time scales through the use of the magnetic hose. We also investigate the influence of the magnetic hose on the coherence time of the qubit.

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