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Detection of single particle impact on a superconducting qubit

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There is a growing interest in exploring how cosmic rays and natural radioactivity affect the performance of superconducting qubits. Previous studies revealed that ionizing radiation can generate quasiparticles, leading to loss of qubit states and errors when multiple qubits are involved. Thus, developing effective strategies to mitigate these effects, is crucial. We conducted experiments on a chip with transmon qubits produced at the Superconducting Quantum Materials and Systems (SQMS) center. The experiments were carried out in a shielded underground facility located at INFN-Gran Sasso, where we exposed the chip to radioactive sources of varying activity levels. In this presentation, we will present our preliminary data and discuss its implications on quantum computing for the development of next-generation quantum devices.

Collaboration

SQMS

Role of Submitter

I am the presenter

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