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Title of presentation: Design and Development of a Cryogenic Magnetic Resonance System for Silicon-Based Quantum Bit Research

Abstract

The essence of a computer is its ability to store and manipulate information.
Classical computers do this using billions of transistors that process electronic signals called bits. While classical computers can perform many tasks efficiently, others are extremely time-consuming. The field of quantum computing aspires to create a computer that can solve these difficult problems by taking advantage of quantum mechanical phenomena. The first step on this journey is developing a quantum bit, an alternative to the electronic bit.

The Silicon Quantum Technology research group at Simon Fraser University is exploring luminescent defects in silicon as candidates for quantum bits. This presentation will describe the development of a cryogenic magnetic resonance system that produces precise oscillating magnetic fields, which will help the group with their research. Design and simulation of resonators and supplementary circuitry will be discussed alongside an assessment of the fabricated devices.