Contribution ID: **1399** Type: **Parallel session talk**

Optical calibration of superconducting quantum sensors for particle detection

Friday 19 July 2024 15:38 (17 minutes)

A major obstacle for detection of meV-scale rare events is demonstrating sufficiently low energy detection thresholds in order to detect recoils from light dark matter particles. We have developed a method of cryogenic optical beam steering that can be used to generate O(μs) pulses of small numbers of photons over the energy range of 0.1 - 5eV and deliver them to any location on the surface of a superconducting device with time and energy features comparable to expected signals. This allows for robust calibration of any photon-sensitive detector, enabling exploration of a variety of science targets including position sensitivity, phonon transport in materials, and the effect of quasiparticle poisoning on detector operation. In this talk, I will review the operating principles of optical beam steering, present current results from our pulse delivery system, and discuss the implementation of this technology for various novel sensor technologies such as HVeV detectors, MKIDs, and qubits.

Alternate track

1. Dark Matter Detection

I read the instructions above

Yes

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Session Classification: Detectors for Future Facilities, R&D, Novel Techniques

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