



Contribution ID: 339

Type: Poster

## Fundamental Properties of Frequency Multiplexed Superconducting Nanowire Kinetic Inductance Detector Array

Thursday, July 25, 2019 6:45 PM (15 minutes)

Kinetic inductance detectors (KIDs) are being implemented in more telescopes due chiefly to their excellent sensitivity and natural multiplexability. We have integrated a superconducting nanowire into the resonant circuits, increasing the frequency response, which in turn, increases the sensitivity for single photon detection. Analyzing the frequency response as a function of optical power, we characterize an array of frequency multiplexed superconducting nanowire single photon detectors (SNSPDs). In this paper, we report on the detector's defining properties, including count rate as a function of optical loading, and the response at low optical power, in a thermal quasi particle dominated state. An analysis is given on the quasi particle lifetime,  $\tau_{qp}$ , using the quasi particle rate equation.

### Less than 5 years of experience since completion of Ph.D

Y

### Student (Ph.D., M.Sc. or B.Sc.)

Y

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**Session Classification:** Poster session

**Track Classification:** Low Temperature Detector Development and Physics