

Contribution ID: 15

Type: **Oral Contribution**

Kinetic Inductors for Measurements of the Cosmic Microwave Background

Wednesday, 22 June 2016 11:40 (25 minutes)

We are developing kinetic inductance detectors (KIDs) for measurements of the polarization of the cosmic microwave background (CMB) radiation. Our goal is to extend the range of applicability of KIDs to wavelengths as long as 1 cm. As a first step, we have designed, fabricated, and tested a 20-pixel prototype LEKID array using a simple quasi-lumped element microstrip design optimized for detecting 100 GHz (3 mm) signals. The devices include superconducting micro-resonators formed from TiN/Ti/TiN trilayers which are deposited by pulsed DC reactive magnetron-sputtering. We discuss design considerations for the array, as well as preliminary detector characterization measurements and results from a study of TiN trilayer properties.

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Session Classification: Session 1: MKIDs for optical, infrared, and millimeter wave telescopes - Part 1

Track Classification: MKIDs for optical, infrared, and millimeter wave telescopes