



SEMINARIO

Nanofabrication and characterization of Superconducting FIR detectors for space exploration

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Preliminary results on the fabrication and characterization of sub-mm broadband lens-coupled Lumped Element Kinetic Inductance Detectors (LEKIDs) will be presented.

Kinetic Inductance Detectors (KID) have recently drawn the attention of the low-temperature detectors community due to their high sensitivity and the intrinsic capability of frequency multiplexed readout which open new possibilities for astronomical observations which need large format arrays of ultrasensitive detectors.

In these work, three different LEKID configurations have been designed both for Earth and Space-based observations. These LEKIDs consists of a combination of niobium titanium nitride (NbTiN) and aluminium (Al) layers on a sapphire substrate. Mask-less photolithography, electron beam lithography, reactive ion etching and ion milling techniques have been used to define the coplanar-waveguide (CPW) feed line, ground planes, the capacitor interdigitated fingers and the meander lines that conform the detector.

Optical and electrical characterization of the detectors has been performed in a closed cycle dilution refrigerator with base temperature of 10 mK. For this purpose, this cryostat includes two high frequency lines (up to 8GHz) and optical access with a black body source.

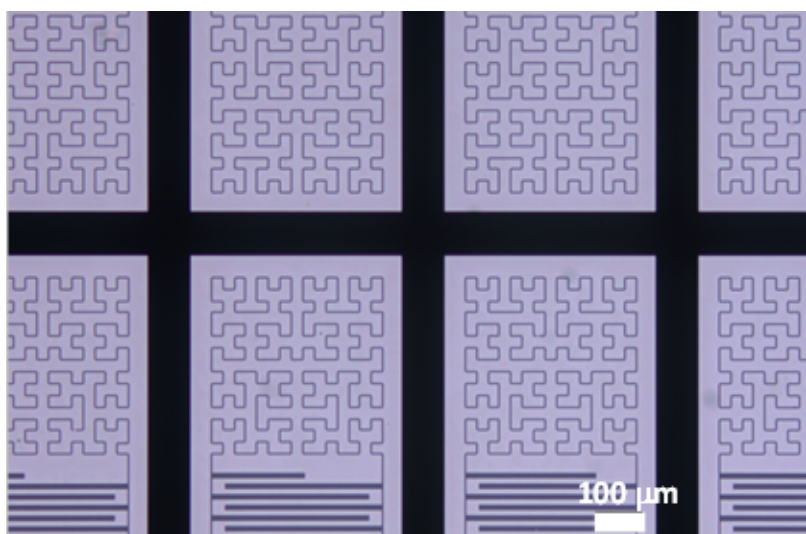


Fig 1. Back illuminated optical image of several pixels of the 850 GHz array defined on the Sapphire substrate.