

Taking a snapshot of KIDs

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Abstract— The inherent multiplexing capability of Microwave Kinetic Inductance Detectors (MKIDs) is one of the great advantage of this type of technology. However the cross-talk between and variations of the resonator frequencies complicate the design and operation of large MKID arrays.. We have developed an optical facility to take snapshot of individual KID pixels. It reimages the KID chip in optical wavelength on-to an image plane outside the cryostat. While scanning a small optical source in this plane we detect the resonator response using conventional microwave technique. In this way we can correlate the resonance frequency of each resonator with its position on the chip. This allows to determine the resonator frequencies pattern across the array chip and enables a comparison with the array design. The measurement of electronic cross talk is also readily available from these measurements. In addition, by using higher magnification optics we can resolve individual KID resonator with greater detail and image its readout current distribution.