

Contribution ID: 14

Type: Oral Contribution

New results from SuperSpec: developing an on-chip, mm-wave, KID-based, filter-bank spectrometer.

Thursday, 23 June 2016 09:55 (25 minutes)

SuperSpec is a novel, ultra-compact spectrometer-on-a-chip for millimeter and submillimeter wavelength astronomy. Its very small size, wide spectral bandwidth, and highly multiplexed detector readout will enable construction of powerful multibeam spectrometers for high-redshift observations of dusty star forming galaxies and intensity mapping of spectral lines from unresolved sources. SuperSpec employs a filter bank consisting of planar, lithographed superconducting transmission line resonators. Each mm-wave resonator is weakly coupled to both the feedline and to the inductive portion of a lumped element Kinetic Inductance Detector (MKID). The design is realized using thin film lithographic structures on a Si wafer, with titanium nitride MKID resonators. Prototypes consisting of sparse arrays have demonstrated background-limited operation at a resolving power of $R \sim 100$, adequate suppression of out-of-band pickup, and well characterized mm-wave filter bank channels. I'll discuss the most recent optical test results for 50-channel, field-ready, prototype die, and plans for the deployment of a four pixel, $R=400$ demonstration instrument covering the 195-310GHz band in 2017.

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Session Classification: Session 3: MKIDs for optical, infrared, and millimeter wave telescopes

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