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An On-Chip Superconducting Kinetic Inductance Fourier Transform Spectrometer for mm-Wave Astronomy

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An on-chip FTS consists of two waveguides coupled to long superconducting transmission lines (STLs) (~ 520 mm) using two coupling probes. The signal propagating on one of the STLs is phase shifted with respect to the other line with a bias current that affects the nonlinear dependence of kinetic inductance, $\mathcal{L}_k(I)$ of the STL material. Here we describe measurements of a superconducting on-chip FTS design coupled to a dual polarization W-band (90 GHz - 110 GHz) waveguide. We also describe the design, simulation, and fabrication of a new broadband planar antenna-coupled on-chip superconducting FTS. These devices have applications in ground-based and space-based millimeter-wave spectral surveys.

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

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