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## Extending KIDs Optical Response to the Mid-IR for Future Space Observatories

*Tuesday, July 23, 2019 6:45 PM (15 minutes)*

The Galaxy Evolution Probe (GEP) is a concept for a NASA Astrophysics Probe-class space observatory to study the physical processes that have influenced galaxy evolution over cosmic time. This requires surveys of the mid- and far-infrared (IR) spectra of galaxies over a broad range of redshifts and cosmic environments. These mid and far-IR observations require large multi-frequency arrays of sensitive detectors. The GEP needs aluminum kinetic inductance detectors (KIDs) for wavelengths of 10-400 microns with NEPs on the order of  $1 \times 10^{-18} \text{ W Hz}^{-1/2}$ . We plan to use lens-coupled, aluminum lumped-element KIDs for the longer wavelengths, similar to those previously tested in our group. KIDs for wavelengths between 10 and 100 microns have not been implemented previously. We present an absorber design for KIDs sensitive to wavelengths of 10 microns shown to have approximately 75% absorption efficiency by HFSS simulations, challenges that come with optimizing our design to increase the wavelength range to 100 microns, and initial tests of our fabricated 10 micron KIDs.

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

Y

### Student (Ph.D., M.Sc. or B.Sc.)

Y

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