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Design and Current Status of the Telescope Deployment of the Superspec Millimeter-wave Spectrometer

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Superspec is an on-chip spectrometer for millimeter and sub-millimeter spectroscopy, with large instantaneous bandwidth (190 - 310 GHz) and moderate resolution (R ~ 300). By using an on-chip filterbank composed of microstrip resonant filters, instead of dispersive optics, and superconducting Kinetic Inductance Detectors (KIDs), Superspec is able to implement a spectrometer on less than 20 cm^2 of a silicon die, orders of magnitude smaller than a comparable grating spectrometer. Thus, Supserspec paves the way for multi-object spectroscopy and integrated-field-unit spectrometer instruments. Superspec is being deployed at the Large Millimeter Telescope (LMT) on the Sierra Negra mountain this year, demonstrating a 3-pixel, dual polarization spectrometer, with background limited sensitivity expected. With the Supespec band, this will allow for the observation of spectral lines in galaxies of redshifts z = 0 - 9, including the CO rotational ladder and the C[II] fine structure line, among others. We present the design of the spectrometer configuration for deployment at the LMT, along with the status and characterization of the instrument hardware.

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

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

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