

SPT-SLIM: A pathfinder for millimeter-wavelength line-intensity mapping on the South Pole Telescope

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Line-intensity mapping (LIM) of millimeter-wavelength tracers is a promising new technique for mapping cosmic structure at redshifts beyond the reach of galaxy surveys. I will describe the design and science motivation for the South Pole Telescope Summertime Line Intensity Mapper (SPT-SLIM), which seeks to demonstrate the use of on-chip spectrometers based on microwave kinetic inductance detectors (MKIDs) for LIM observations of CO at $z \sim 1-3$. The design of SPT-SLIM is enabled by key technical developments, including MKID-coupled R=300 filter-bank spectrometers between 120-180 GHz, as well as a new low-cost, high-throughput MKID read-out architecture based on the ICE platform. When deployed in the 2022-23 austral summer, SPT-SLIM will produce strong constraints on the CO power spectrum, while developing the experimental and observational techniques needed to use LIM as a cosmological probe in future survey instruments.

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