Design and status of TIME, a mm-wavelength spectrometer array for [CII] and CO intensity mapping

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Abstract

TIME is a new mm-wavelength spectrometer array targeting [CII] during the Epoch of Reionization (redshift z ˜ 5 to 9) and CO during the peak of cosmic star formation (redshift z ˜ 0.5 to 2). TIME will use two banks of 16 single-polarization spectrometers with spectral range 183 to 326 GHz, each consisting of a curved diffraction grating in parallel plate waveguide. The output arc of each spectrometer is sampled by 60 TES bolometers (1920 detectors total), providing a spectral resolution of R˜100. TIME recently completed an engineering run with a partial focal plane at the 12m APA on Kitt Peak, where we achieved first light. We intend to return with a completed instrument for a science run beginning in late 2020.

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