

Abstract Submitted
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Ultrafast electro-optic modulation for Terahertz up-conversion spectroscopy MATTHEW DECAMP, ZHIYUAN CHEN, University of Delaware — Traditional time-domain terahertz (THz) spectroscopy techniques require the combination of sub-picosecond laser systems and time-delay stages for spectral analysis, making the design of a portable THz spectrometer challenging. In this work, we demonstrate an alternative method of spectrally resolving coherent THz radiation using narrow band optical light and passive optical spectrum analyzers. This method utilizes THz induced electro-optic modulation of a narrow band laser to upconvert the spectral content of the THz radiation to the visible portion of the electro-magnetic spectrum. This device does not require any movable parts and is well suited for spectrally analyzing both broadband and narrowband THz radiation. The spectral resolution of this technique is limited by the bandwidth of the optical radiation and the non-linear medium. Further advancements will include the development of a portable THz spectrometer, suitable for either research or clinical applications.

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