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Title: Characterisation of Terahertz Beam Profile and Propagation through Complex Quasi-Optic Systems.
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Abstract: We report on a simple technique, readily applicable to existing Terahertz Time Domain Spectroscopy (THz-TDS) systems, that allows the spatial distribution of the terahertz beam to be resolved in both the temporal and frequency domains. It requires minimal equipment and no adjustment of the pump/probe path lengths of the electro-optic detection system. While THz TDS has become widely used, in many cases a considerable amount of unknowns exist regarding the THz beam profile and its evolution as it propagates through the system. Misalignment and poor beam shape can lead to results with reduced amplitude of detected frequency components, frequency shifted components, and narrowed spectra. [1] Characterization of the beam profile allows for better alignment of the optics, increased efficiency and improved measurement accuracy. We present the results of this technique and compare them with a model of Gaussian beam optics.
Keywords: Terahertz, Quasi-optical, Beam profile, Coherent, Time-domain Spectroscopy