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Electro-optic Sampling of Broadband Terahertz Radiation in 2+1 Dimensions Using a CCD[1] GEORGE HINE, Oak Ridge National Lab — With its shorter wavelength compared to microwave radiation and recent advances in available intensities, THz radiation offers an interesting prospect to develop compact and powerful particle accelerators. To this aim, reaching high accelerating gradients at THz frequencies is paramount and requires advances in THz characterization techniques. The electrooptic sampling method presented here allows measurement of the 3D field profile of the THz radiation. THz pulses are generated by optical rectification in organic crystals pumped by a Ti:Sapphire-pumped OPA. The electric field of the THz pulse induces a local polarization rotation in an ultrashort and transversely oversized probe pulse in zinc blende crystals. This polarization rotation manifests as an intensity response on a CCD after passing through a polarizer, which is analyzed to recover the instantaneous 2D transverse profile of the THz electric field. The full 3D distribution of the THz pulse is finally obtained by varying the delay of the ultrashort probe pulse.

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