Abstracts

Characterization of an Optoelectronic Terahertz Beam System

M. Van Exter and D.R. Grischkowsky. "Characterization of an Optoelectronic Terahertz Beam System." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1684-1691.

We describe the performance of an optoelectronic THz beam system. The transmitter operation is based on the repetitive, subpicosecond laser excitation of a Hertzian dipole antenna embedded in a charged coplanar line. With this transmitter electromagnetic beams of 1/2 cycle THz pulses at a repetition rate of 100MHz are produced. The associated optoelectronic receiver is gated in synchronism with the excitation of the transmitter by subpicosecond pulses from the same laser source. With this receiver, the 10 nW beams of THz pulses were observed with a signal-to-noise ratio greater than 10 000:1. Several sources contributing to the noise of the receiver are discussed, together with ways to reduce them. With an integration time of 125 ms, a signal-to-noise ratio of 1 is obtained for a THz beam with an average power of 10/sup -16/ W. The receiver operates in the sampling mode and has a time resolution of 0.5 ps.

❑ Return to main document.