367.

Accession number:20113714319576 Title:Self-referenced method for terahertz wave time-domain spectroscopy Authors: Redo-Sanchez, Albert (1); Zhang, Xi-Cheng (1) Author affiliation:(1) Rensselaer Polytechnic Institute, 110 Eighth St., Troy, NY 12180, United States Corresponding author: Zhang, X.-C.(zhangxc@rpi.edu) Source title:Optics Letters Abbreviated source title:Opt. Lett. Volume:36 Issue:17 Issue date:September 1, 2011 Publication year:2011 Pages:3308-3310 Language:English ISSN:01469592 E-ISSN:15394794 CODEN:OPLEDP Document type: Journal article (JA)

Publisher:Optical Society of America, 2010 Massachusetts Avenue NW, Washington, DC 20036-1023, United States

Abstract:The method allows retrieval of the absorbance of a sample without the need for a reference measurement. The method measures the dynamic variation of frequency resolution as the waveform is being acquired. In terahertz wave time-domain spectroscopy, the frequency resolution increases as the temporal window increases. Therefore, narrow absorption peaks will appear in the spectrum when the temporal window is long enough to resolve the peak. By measuring the dynamic values of each frequency component at specific points in time, a reference value and a peak value are extracted and, hence, the self-referenced is achieved. In addition, the method provides a mechanism to remove the effects of echoes, which enables arbitrary temporal window length and, thus, achieves high-resolution frequency. Examples of extraction of the water vapor lines and resonant features in gas and semiconductors are demonstrated in transmission and reflection geometries.

Number of references:13