Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Real-Time THz Imaging Using Full-Field Electro-Optic Sampling

A. AYESHESHIM, I. BUSHFIELD, F.A. HEGMANN, Department of Physics, University of Alberta, Edmonton, AB, T6G 2G7, Canada — Real time terahertz imaging offers diverse opportunities and applications for non-destructive imaging applications [1,2]. In this paper, we demonstrate real-time THz imaging of still, moving, and concealed objects. Using a Ti: sapphire amplifier laser system, a THz beam is generated and detected via optical rectification and EO sampling respectively using [110] ZnTe wafers. Real time THz video rate imaging of metal objects and dripping water within a cardboard cylinder are clearly seen by an 8-bit grayscale CCD camera. The ring-like temporal and spatial intensity distribution of the various frequency components of the THz signal on the focal plane is also studied. To improve SNR, we use frame averaging and dynamic subtraction methods [3].

[1] B .B. Hu and M. C. Nuss, *Opt.Lett. 20, 1716(1995).*
[2] K.Kawase, Y.Ogawa, Y.Watanabe, *Opt. Express 11, 2546(2003).*
[3] Z.Jiang, X.G.Xu, and X. -C. Zhang, *Appl.Opt.39, 2982-2987(2000).*

Tyler Cocker
Department of Physics, University of Alberta,
Edmonton, AB, T6G 2G7, Canada

Date submitted: 06 Dec 2009 Electronic form version 1.4