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Title:Inexpensive THz focal plane array imaging using miniature neon indicator lamps as detectors

Authors:Rozban, Daniel (1); Levanon, Assaf (3); Joseph, Hezi (2); Akram, Avihai (3); Abramovich, Amir (1); Kopeika, Natan S. (2); Yitzhaky, Yitzhak (2); Belenky, Alexander (2); Yadid-Pecht, Orly (2)

Author affiliation:(1) Department of Electrical and Electronic Engineering, Ariel University Center of Samaria, Ariel 44837, Israel; (2) Department of Electro-Optical Engineering, Ben-Gurion University of the Negev, Beer-Sheva 84105, Israel; (3) Department of Electrical and Computer Engineering, Ben-Gurion University of the Negev, Beer-Sheva 84105, Israel

Corresponding author:Rozban, D.(rozbandaniel@gmail.com)

Abstract: Development of focal plane arrays (FPAs) for mm wavelength and THz radiation is presented in this paper. The FPA is based upon inexpensive neon indicator lamp Glow Discharge Detectors (GDDs) that serve as pixels in the FPA. It was shown in previous investigations that inexpensive neon indicator lamp GDDs are quite sensitive to mm wavelength and THz radiation. The diameters of GDD lamps are typically 3-6 mm and thus the FPA can be diffraction limited. Development of an FPA using such devices as detectors is advantageous since the costs of such a lamp is around 30-50 cents per lamp, and it is a room temperature detector sufficiently fast for video frame rates. Recently, a new 8×8 GDD FPA VLSI control board was designed, constructed, and experimentally tested. First, THz images using this GDD FPA are given in this paper. By moving around the 8×8 pixel board appropriately in the image plane, 32×32 pixel images are also obtained and shown here, with much improved image quality because of much reduced pixelization distortion.

Number of references:19