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**Metamaterial Based Terahertz Detector** ANDREW STRIKWERDA, Boston University, HU TAO, Tufts University, EMIL KADLEC, Sandia National Laboratories, KEBIN FAN, Boston University, WILLIE PADILLA, Boston College, RICHARD AVERITT, Boston University, ERIC SHANER, Sandia National Laboratories, XIN ZHANG, Boston University — We have designed, fabricated, and characterized metamaterial enhanced bimaterial cantilever pixels for far-infrared detection. Local heating due to absorption from split ring resonators (SRRs) incorporated directly onto the cantilever pixels leads to mechanical deflection which is readily detected with visible light. Highly responsive pixels have been fabricated for detection at 95 GHz and 693 GHz, demonstrating the frequency agility of our technique, and their subwavelength nature enables their use as a focal plane array (FPA) to image near the diffraction limit. We have obtained single pixel responsivities as high as 16,500 V/W and noise equivalent powers of 10<sup>-8</sup> W/Hz<sup>1/2</sup> with these first-generation devices, which were achieved at room temperature and pressure. Consequently, MMs hold great promise for facilitating the development of a “versatile” THz detector which can a) strongly absorb THz radiation; b) operate at room temperature; c) function as a multi-pixel array for imaging applications; and d) be lightweight and low cost.

Prefer Oral Session  
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