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Title:Coherent detection of multiband terahertz radiation using a surface plasmon-polariton based photoconductive antenna

Authors:Liu, Shuchang (1); Shou, Xiang (1); Nahata, Ajay (1)

Author affiliation:(1) Department of Electrical and Computer Engineering, University of Utah, Salt Lake City, UT 84112, United States; (2) Guardian Industries, Auburn Hills, MI 48326, United States

Corresponding author:Liu, S.(scliu@ece.utah.edu)

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Abstract:We characterize a dipole antenna structure that allows for coherent detection of narrowband terahertz radiation with enhanced sensitivity at the resonant frequency. The antenna incorporates a corrugated metal structure that surrounds the dipole. Each periodically spaced groove in the corrugation couples an approximate replica of the incident THz pulse to a surface plasmon-polariton pulse, which then propagates towards and is detected by the dipole. We use numerical simulations to validate the experimental data. Based on these results, we describe a multiband dipole antenna detector that allows for enhanced sensitivity at multiple frequencies. This device can also be used as an emitter.

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