

Abstract Submitted
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Design and fabrication of two probes for Near Field THz imaging

¹ ANGELICA GARCIA, GAUDENCIO PAZ, ccadet unam, JOEL PEREZ, OIST, NASER QURESHI, ccadet unam, MICROWAVE PHOTONICS TEAM — THz imaging has gained attention due to the potential applications in medicine, security, inspections on semiconductor devices, etc. Until now, systems devoted to Near Field THz imaging consist of two basic parts: generation of THz radiation and a sensing probe system. In this work we present two approaches to make a probe for near field THz imaging. The first one is a novel device capable of integrate in a single chip the THz source with the sensing system. The device is fabricated in a GaAs substrate, on one side a photoconductive gold antenna is printed using microfabrication techniques; on the opposite side a specifically designed bow tie sub-wavelength sized bow-tie aperture is placed centered to the gap of the antenna. According to our simulations, the aperture exhibits field enhancement at the metal tips when it is illuminated from the substrate side by the THz radiation emitted from the antenna. The second device is a tapered conical waveguide with micrometrical aperture size at the end. A commercial silicon lens is used to focus the THz radiation emitted from a photoconductive antenna on the aperture. Simulation in COMSOL is used to find the best taper angle where reflection and loss are reduced.

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