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Title:Single-walled carbon nanotubes as base material for THz photoconductive switching: A theoretical study from input power to output THz emission

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Abstract:This paper studies the relation between photoexcitation of a single-walled carbon nanotube (SWNT) based device, and its THz output power in the context of THz photoconductive (PC) switching and THz photomixing. A detailed approach of calculating output THz power for such a device describes the effect of each parameter on the performance of the THz PC switch and highlights the design dependent achievable limits. A numerical assessment, with typical values for each parameter, shows thatsubject to thermal stability of the device-SWNT based PC switch can improve the output power by almost two orders of magnitudes compared to conventional materials such as LT-GaAs.

Number of references:46