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Title:Coherent population trapping in quantum cascade photodetector as a new method for terahertz detection
Authors:Zyaei, M. (1); Rostami, A. (2); Saghai, H. Rasooli (3); Baghban, H. (2)
Author affiliation:(1) Islamic Azad University, Ajabshir Branch, Department of Electrical Engineering, Ajabshir, Iran; (2) School of Emerging Engineering Technologies, University of Tabriz, Tabriz, Iran; (3) Islamic Azad University, Tabriz Branch, Department of Electrical Engineering, Tabriz, Iran
Corresponding author:Zyaei, M.(m_zyaei_sh@yahoo.com)
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Abstract:In this article a novel terahertz photodetector based on coherent population trapping (CPT) and in quantum well cascade format is introduced and supplementary simulations and discussions are presented to fulfill the proposed idea. In this scheme, the interference of a short-wavelength probe signal and the terahertz (THz) signals modifies the absorption coefficient of the active region and thus, detection of the short wavelength probe is translated as detection of the THz signal. A ladder structure coupled to the active region extracts the probe-excited carriers and transports them to consequent period via phonon-mediated transport just like conventional quantum cascade structures.
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Main heading:Signal detection
Controlled terms:Charge trapping - Phonons - Photodetectors - Probes - Quantum chemistry - Semiconductor quantum wells
Uncontrolled terms:Absorption coefficients - Active regions - Coherent population trapping - Ladder structures - Phonon-mediated transport - Probe signals - Quantum cascade structures - Quantum cascades - Quantum interference - Short wavelengths - Short-wavelength - Tera Hertz - Terahertz detection - Terahertz signals - THz signal
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