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Accession number:20123515374409

Title:Photon-assisted tunneling through self-assembled InAs quantum dots in the terahertz frequency range

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Source title:Physical Review Letters

Abbreviated source title:Phys Rev Lett

Volume:109

Issue:7

Issue date:August 16, 2012

Publication year:2012

Article number:077401

Language:English

ISSN:00319007

E-ISSN:10797114

CODEN:PRLTAO

Document type:Journal article (JA)

Publisher:American Physical Society, One Physics Ellipse, College Park, MD 20740-3844, United States

Abstract:We have investigated terahertz (THz) photon-assisted tunneling in single self-assembled InAs quantum dots (QDs). Two types of photon-assisted tunneling processes have been observed in the THz range: ground state resonance and photon-induced excited state resonance, depending on the relative magnitude between the orbital quantization energy of the QDs and the THz photon energy. Furthermore, we could realize a very high coupling efficiency between THz waves and QDs and observed multiphoton absorption up to the fourth-order during the tunneling process, resulting in almost complete lifting of the Coulomb blockade. © 2012 American Physical Society.

Number of references:17

Main heading:Two photon processes

Controlled terms:Indium arsenide - Photons - Semiconductor quantum dots

Uncontrolled terms:Coupling efficiency - Fourth-order - InAs quantum dots - Multi-photon absorption - Photon-assisted tunneling - Quantization energy - Self-assembled - Terahertz - Terahertz frequency range - THz photon - THz waves - Tunneling process

Classification code:714.2 Semiconductor Devices and Integrated Circuits - 741.1 Light/Optics - 804.2 Inorganic Compounds

DOI:10.1103/PhysRevLett.109.077401

Database:Compendex

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