172
Accession number:20122815232428
Title:Helicity sensitive terahertz radiation detection by field effect transistors
Authors:Drexler, C. (1); Dyakonova, N. (2); Olbrich, P. (1); Karch, J. (1); Schafberger, M. (1); Karpierz, K. (3); Mityagin, Yu. (4); Lifshits, M.B. (2); Teppe, F. (2); Klimenko, O. (2); Meziani, Y.M. (6); Knap, W. (2); Ganichev, S.D. (1)
Author affiliation:(1) Terahertz Center, University of Regensburg, 93040 Regensburg, Germany; (2) Laboratoire Charles Coulomb, UMR 5221, Universite Montpellier 2, France; (3) Institute of Experimental Physics, University of Warsaw, Hoza 69, 00-681 Warsaw, Poland; (4) Lebedev Physical Institute, 53 Leninsky prospect, 119991 Moscow, Russia; (5) A. F. Ioffe Physico-Technical Institute, 194021 St. Petersburg, Russia; (6) Departamento de Fisica Aplicada, Universidad de Salamanca, E-37008 Salamanca, Spain
Corresponding author:Drexler, C.
Source title:Journal of Applied Physics
Abbreviated source title:J Appl Phys
Volume:111
Issue:12
Issue date:June 15, 2012
Publication year:2012
Article number:124504
Language:English
ISSN:00218979
CODEN:JAPIAU
Document type:Journal article (JA)
Publisher:American Institute of Physics, 2 Huntington Quadrangle, Suite N101, Melville, NY 11747-4502, United States
Abstract:Terahertz light helicity sensitive photoresponse in GaAs/AlGaAs high electron mobility transistors. The helicity dependent detection mechanism is interpreted as an interference of plasma oscillations in the channel of the field-effect-transistors (generalized Dyakonov-Shur model). The observed helicity dependent photoresponse is by several orders of magnitude higher than any earlier reported one. Also, linear polarization sensitive photoresponse was registered by the same transistors. The results provide the basis for a new sensitive, all-electric, room-temperature, and fast (better than 1 ns) characterisation of all polarization parameters (Stokes parameters) of terahertz radiation. It paves the way towards terahertz ellipsometry and polarization sensitive imaging based on plasma effects in field-effect-transistors. © 2012 American Institute of Physics.
Number of references:44
Main heading:Polarization
Controlled terms:High electron mobility transistors - Plasma oscillations - Terahertz waves
Uncontrolled terms:Detection mechanism - GaAs/AlGaAs - Helicities - Linear polarization - Orders of magnitude - Photoresponses - Plasma effects - Polarization parameters - Polarization sensitive - Room temperature - Stokes parameters - Tera Hertz - Terahertz light - Terahertz radiation - Terahertz radiation detection
Classification code:711 Electromagnetic Waves - 711.1 Electromagnetic Waves in Different Media

- 714.2 Semiconductor Devices and Integrated Circuits - 932.3 Plasma Physics
DOI:10.1063/1.4729043
Database:Compendex