390.
Accession number:13011864
Title:Graphene hyperlens for terahertz radiation
Authors:Andryieuski, A. (1); Lavrinenko, A.V. (1); Chigrin, D.N. (2)
Author affiliation:(1) Dept. of Photonics Eng., Tech. Univ. of Denmark, Lyngby, Denmark; (2) Inst. of High-Freq. & Commun. Technol., Univ. of Wuppertal, Wuppertal, Germany
Source title:Physical Review B (Condensed Matter and Materials Physics)
Abbreviated source title:Phys. Rev. B, Condens. Matter Mater. Phys. (USA)
Volume:86
Issue:12
Publication date:15 Sept. 2012
Pages:121108 (5 pp.)
Language:English
ISSN:1098-0121
CODEN:PRBMDO
Document type:Journal article (JA)
Publisher:American Physical Society
Country of publication:USA
Material Identity Number:DQ91-2012-035
Abstract:We propose a graphene hyperlens for the terahertz (THz) range. We employ and numerically examine a structured graphene-dielectric multilayered stack that is an analog of a metallic wire medium. As an example of the graphene hyperlens in action, we demonstrate an imaging of two point sources separated by a distance $\lambda_0/5$. An advantage of such a hyperlens as compared to a metallic one is the tunability of its properties by changing the chemical potential of graphene. We also propose a method to retrieve the hyperbolic dispersion, check the effective medium approximation, and retrieve the effective permittivity tensor.
Number of references:31
Inspec controlled terms:graphene - permittivity - terahertz waves
Uncontrolled terms:graphene hyperlens - terahertz radiation - structured graphene-dielectric multilayered stack - metallic wire medium - point sources - chemical potential - hyperbolic dispersion - effective medium approximation - effective permittivity tensor - C
Inspec classification codes:A7865V Optical properties of fullerenes and related materials (thin films/low-dimensional structures)
Chemical indexing:C
Treatment:Experimental (EXP)
Discipline:Physics (A)
DOI:10.1103/PhysRevB.86.121108
Database:Inspec