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Accession number:WOS:000307307700004

Title:Surface Plasmon Resonant THz Wave Transmission on Carbon Nanotube Film

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Source title:PLASMONICS

Abbreviated source title:PLASMONICS

Volume:7

Issue:3

Issue date:SEP 2012

Pages:411-415

Language:English

ISSN:1557-1955

Document type:Article

Publisher:SPRINGER, 233 SPRING ST, NEW YORK, NY 10013 USA

Abstract:The properties of the terahertz resonant surface plasmons wave on the carbon nanotube film and dielectric interface have been investigated. As a first step towards engineering terahertz SPPs-like surface modes, we present a computer experiment to demonstrate that the carbon nanotube film surface can also be employed to concentrate and guide the terahertz SPPs wave. The carbon nanotube film is modeled in an experimentally realizable geometry. It is shown that a unique electromagnetic surface mode in terahertz region can be supported along the carbon nanotube film/dielectric interface when the free-space broadband terahertz pulse is incident on the carbon nanotube film with subwavelength gratings. Comparing with noble metals, plasmonic nano-structure materials based on carbon nanotube film offer a potentially more versatile approach to engineering tightly confined surface modes in the THz regime.

Number of references:22

Main heading:Chemistry; Science & Technology - Other Topics; Materials Science

DOI:10.1007/s11468-011-9322-4