311.
Accession number:20113314231042
Title:Multiwall carbon nanotubes at RF-THz frequencies: Scattering, shielding, effective conductivity, and power dissipation
Authors:Berres, Jay A. (1); Hanson, George W. (1)
Author affiliation:(1) Department of Electrical Engineering, University of Wisconsin-Milwaukee, Milwaukee, WI 53211, United States
Corresponding author:Berres, J.A.(jaberres@gmail.com)
Source title:IEEE Transactions on Antennas and Propagation
Abbreviated source title:IEEE Trans Antennas Propag
Volume:59
Issue:8
Issue date:August 2011
Publication year:2011
Pages:3098-3103
Article number:5871281
Language:English
ISSN:0018926X
CODEN:IETPAK
Document type:Journal article (JA)
Publisher:Institute of Electrical and Electronics Engineers Inc., 445 Hoes Lane / P.O. Box 1331, Piscataway, NJ 08855-1331, United States
Abstract:Isolated, infinitely long multiwall carbon nanotubes (MWCNTs) interacting with electromagnetic waves in the microwave and far-infrared frequency regime are analyzed using a semi-classical approach. An expression for the bulk effective conductivity of MWCNTs is obtained, valid up to THz frequencies. The influence of the number of tube walls, the radius of the outermost tube wall, and the presence of a gold core on scattering and shielding is analyzed. Comparisons between metallic MWCNTs, metallic single wall carbon nanotubes (SWCNTs), and metal nanowires are provided.
Number of references:22