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Title:Terahertz transmission ellipsometry of vertically aligned multi-walled carbon nanotubes
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Abstract:We demonstrate time-resolved terahertz transmission ellipsometry of vertically aligned multi-walled carbon nanotubes. The angle-resolved transmission measurements reveal anisotropic characteristics of the terahertz electrodynamics in multi-walled carbon nanotubes. The anisotropy is, however, unexpectedly weak: the ratio of the tube-axis conductivity to the transverse conductivity, $\sigma_z\sigma_{xy} \propto 2.3$, is nearly constant over the broad spectral range of 0.4-1.6 THz. The relatively weak anisotropy and the strong transverse electrical conduction indicate that THz fields readily induce electron transport between adjacent shells within multi-walled carbon nanotubes.
Number of references:33
Inspec controlled terms:carbon nanotubes - electrical conductivity - electrodynamics - ellipsometry - terahertz wave spectra
Uncontrolled terms:electron transport - transverse electrical conduction - transverse conductivity - tube-axis conductivity - terahertz electrodynamics - angle-resolved transmission measurements - time-resolved terahertz transmission ellipsometry - vertically-aligned multiwalled carbon nanotubes - frequency 0.4 THz to 1.6 THz - C
Inspec classification codes:A7865V Optical properties of fullerenes and related materials (thin films/low-dimensional structures) - A7360T Electrical properties of fullerenes and related materials (thin films/low-dimensional structures) - A7870G Microwave and radiofrequency interactions with condensed matter
Numerical data indexing:frequency 4.0E+11 1.6E+12 Hz
Chemical indexing:C/el
Treatment:Experimental (EXP)
Discipline:Physics (A)

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