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Title

Transmission of terahertz radiation by anisotropic MWCNT/polystyrene composite films

Source

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Abstract

composite materials have been prepared by repeated forge rolling of polystyrene and carbon nanotubes (CNTs) with length of similar to 65 μm . Transmission spectra of the composites were recorded for two different polarizations of the electric field. Obtained data indicated that the forge rolling resulted in a predominant orientation of CNTs in polymer matrix. Anisotropic response of the composites was measured at 130 μm wavelength on the Novosibirsk terahertz free electron laser and angular dependence of the transmitted light was determined. Absorption spectrum showed no strong resonance features and it was interpreted by CNTs breaking and agglomeration of CNT fragments during the composite fabrication procedure. Based on classical theory of scattering, considered the scatters as electromagnetic antennas, the size distribution of CNTs in composites was found.