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Title:Antenna and detector of terahertz radiation based on the double-carbon-nanotube system
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Abstract:The system of the two same, placed side-by-side and double clamped single-walled carbon nanotubes with metallic conductivity in the electromagnetic field of modulated and non-modulated terahertz radiation is considered. Forced oscillations of the carbon nanotubes electron plasma are calculated. The lumped parameters of the mechanical resonators that the nanotubes represent by themselves are determined. It is shown that the considered system of the nanotubes can serve as a detector of modulated terahertz radiation. The responsivity of the detector is estimated. The threshold value of the electric field amplitude of the incoming monochromatic terahertz radiation, above which the self-excitation of the nanotube mechanical resonators occurs is estimated.
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