89
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Title:Double graphene-layer plasma resonances terahertz detector
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Abstract:We propose a detector of terahertz radiation based on a double graphene-layer heterostructure utilizing the tunnelling between graphene layers and the resonant excitation of plasma oscillations (standing plasma waves). Using the developed device model, we substantiate the detector operation and calculate the spectral characteristics. It is shown that the detector responsivity exhibits the resonant peaks when the frequency of incoming terahertz radiation approaches the resonant plasma frequencies. These frequencies are tuned by the bias voltage. The height of the responsivity resonant peaks in sufficiently perfect double graphene-layer heterostructures can markedly exceed those in the resonant plasma-wave detectors based on the standard heterostructures and utilizing the plasma hydrodynamic nonlinearity. © 2012 IOP Publishing Ltd.
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