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标题: Theory research of negative dynamic conductivity in electrically pumped multiple graphene layer structures with split gates
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摘要: The negative dynamic conductivity of graphene in THz range makes it to be a promise medium in THz radiation and amplification. This paper proposes electrically pumped multiple graphene layer structures with split gates, sets up the theory model of electrically induced n-i-p junction, calculates the ac conductivity associated with the interband and intraband transitions under the conditions of population inversion, discusses the bias voltage, gate voltage, number of graphene layers and the momentum relaxation time dependences of ac conductivity. It is shown that the real part of dynamic conductivity within terahertz range can be negative in certain conditions, namely, interband radiation is greater than the intraband absorption, which demonstrates the feasibility of taking electrically pumped multiple graphene layer structures with split gates as an active medium in radiating terahertz coherent source.
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