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标题: Room-temperature strong terahertz photon mixing in graphene
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摘要: We demonstrate that single layer graphene exhibits a strong nonlinear photon-mixing effect in the terahertz frequency regime. Up to room temperature, the third-order nonlinear current in graphene grows rapidly with increasing temperature. The third-order nonlinear current can be as strong as the linear current under a moderate electric field strength of 10(4) V/cm. Because of the unique Dirac behavior of the graphene quasi-particles, low Fermi level and electron fillings optimizes the optical nonlinearity. Under a strong-field condition, the strong-field-induced Dirac fermion population redistribution and nonequilibrium carrier heating effects further amplify the optical nonlinearity of graphene. Our results suggest that doped graphene can potentially be utilized as a strong terahertz photon mixer in the room-temperature regime. (C) 2012 Optical Society of America
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