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标题: Monte Carlo studies of the intrinsic time-domain response of nanoscale three-branch junctions
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摘要: We present a Monte Carlo time-domain study of nanostructured ballistic three-branch junctions (TBJs) excited by both step-function and Gaussian picosecond transients. Our TBJs were based on InGaAs 2-dimensional electron gas heterostructures and their geometry followed exactly the earlier experimental studies. Time-resolved, picosecond transients of both the central branch potential and the between-the-arms current demonstrate that the bandwidth of the intrinsic TBJ response reaches the THz frequency range, being mainly limited by the large-signal, intervalley scattering, when the carrier transport regime changes from ballistic to diffusive. (C) 2012 American Institute of Physics. [http://dx.doi.org/10.1063/1.4704371]
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