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摘要: We theoretically investigated GaN-based resonant phonon terahertz-quantum cascade laser (QCL) structures for possible high-temperature operation by using the non-equilibrium Green's function method. It was found that the GaN-based THz-QCL structures do not necessarily have a gain sufficient for lasing, even though the thermal backfilling and the thermally activated phonon scattering are effectively suppressed. The main reason for this is the broadening of the subband levels caused by a very strong interaction between electrons and longitudinal optical (LO) phonons in GaN. (C) 2012 American Institute of Physics. [http://dx.doi.org/10.1063/1.4704389]
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