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Title:Hot-optical-phonon effects on electron relaxation in optically pumped step quantum well structures
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Abstract:In this paper, hot optical phonon effects are included into the ensemble Monte Carlo simulation process to investigate the electron relaxation in optically pumped GaAs/AlxGa1-xAs step quantum wells (QWs) which can be used as potential terahertz laser prototypes. Compared with hot LO-phonons causing intersubband transitions, it is shown that hot LO-phonons causing the electron intrasubband transitions play a main role in slowing of electron relaxations. The hot LO-phonon effects of subbands 1 and 2 are found to mainly come from the contributions of the LO-phonon emission of hot electron intrasubband transitions on subband 0. The simulated results suggest that hot phonon effect should be included into the numerical studies of optically pumped QW THz lasers. 
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