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Title:Monte Carlo simulation of the effect of bias electric field on intensity of THz radiation

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Abstract:To study the effect of bias electric field on the intensity of continuous-wave (CW) terahertz (THz) radiation from the microscopic view, ensemble Monte Carlo method was used to simulate the carriers transport processes under bias electric field. The simulation results show that, due to the effects of space charge screening and scattering, the intensity of CW THz radiation firstly increases as the bias electric field increases, and then saturates finally after reaching peak value. Although the possibility of carrier scattering drops as temperature reduces, the initial energy of photoexcited carrier decreases, so the power of CW THz radiation is lower at low temperature than at normal temperature when the bias electric field is low, but becomes higher when the bias electric field is above a certain threshold.

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