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Title

Crossover between surface field and photo-Dember effect induced terahertz emission

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Abstract

Pulsed terahertz emission from semiconductor surface illuminated by femtosecond laser pulse is analyzed. The analysis is based on the Boltzmann transport equation. It is shown that terahertz emission is induced by the surface field if the photon energy is close to the band-gap energy. The terahertz emission is controlled by the photo-Dember effect when the photon energy significantly exceeds the band-gap energy. A compact criterion for the crossover between the two mechanisms of terahertz emission is obtained. The analytical results are compared to the results of detailed Monte Carlo simulations. (18 References).