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Charged impurity scattering of electrons in quasi-two dimensional semiconductor systems

ABSTRACT. In this paper the dependencies between the relaxation period of electrons and the energy of mobility and temperature in a quasi-two dimensional, nondegenerate semiconductor nanostructure, using a common model of the admixture centre, are calculated. The electrons' relaxation period and their mobility depend on the depth of the nanostructure, and even more upon the radius of the short-range potential influence (first coordination sphere radius). Moreover, the electron relaxation time $\tau(\varepsilon) \sim \varepsilon$ and mobility $\mu(kT) \sim (k_B T)$, and a formula is derived for the thermal electromotive force of this system.

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