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Effects of disorder on recombination and relaxation processes via acoustic phonons in graphene FEDIR VASKO, VLADIMIR MITIN, ANDREI SERGEEV, SUNY at Buffalo — Recombination and relaxation processes via acoustic phonons are allowed in a disordered graphene because of violation of the energy-momentum conservation requirements. These processes are analyzed taking into account the interference of electron-phonon and electron-impurity scattering mechanisms. The recombination and relaxation rates are calculated for the cases of intrinsic and heavily-doped graphene. The transient evolution of nonequilibrium carriers is described by the exponential fit dependent on doping conditions and disorder level. The obtained electron recombination and relaxation rates are compared with available experimental data. [1] F. Vasko et al., Phys. Rev. B 84, 155445 (2011).

Fedir Vasko
SUNY at Buffalo

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