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Plasmonic heat transfer between graphene and dielectric substrate DAN YOU, SLAVA V. ROTKIN, Physics Department and Center for Advanced Materials and Nanotechnology, Lehigh University — This work focuses on the near-field heat transfer between graphene monolayer and a dielectric substrate by taking into account the coupling of the surface plasmon- and phonon-polaritons in graphene and in the substrate respectively. The surface plasmon and phonon polaritons are coupled to the bulk optical phonons in the substrate and in graphene that constitute thermal reservoirs, to which the surface modes are strongly coupled. We assume that the reservoirs are large and have a short relaxation time scale. The surface modes are affected by coupling to reservoir, and their energy is irreversibly dissipated into the reservoir. The frequency-dependent relaxation rate of the surface plasmon and phonon polaritons is further derived within the nonequilibrium Green's function method. Finally the calculation of the heat conductance between graphene and substrate is presented.

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