Inelastic Coulomb scattering of 2D graphene[1] EUYHEON HWANG,
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The inelastic quasiparticle lifetime of 2D graphene is calculated using the full dynamically screened Coulomb interaction. We calculate the imaginary part of the quasiparticle self-energy for doped (or gated) graphene, using the G_0W and random phases approximations. At low energy regimes, the intraband single particle excitation (SPE) and plasmon contribute to the self energy, but the interband SPE does not contribute to the self energy due to the phase space restrictions. At higher energies ($\omega \gtrsim E_F$) interband SPE contribution increases sharply, overwhelming the intraband SPE and plasmon contribution. The calculated inelastic quasiparticle lifetime is significantly different from semiconductors with parabolic bands because of linear energy dispersion and chiral properties of graphene.

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