Single-particle relaxation time versus scattering time in 2D graphene layers[1] EUYHEON HWANG, SANKAR DAS SARMA, University of Maryland, College Park — We calculate the transport scattering time (τ_t) and the single particle relaxation time (τ_s) for disordered graphene in the lowest order of the electron-impurity interaction (Born approximation). We find that the ratio of τ_t to τ_s is always greater (less) than two for charged Coulomb (short-ranged neutral) scatterers. Thus, the calculated scattering time ratio can be a good criterion of directly selecting the dominant scattering mechanism in graphene. As a direct consequence of scattering times we calculate graphene mobility, damping rate, and density of states of single particle state.

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