

Abstract Submitted  
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**Ab initio study of hot carrier lifetime in graphene and bilayer graphene**<sup>1</sup> CHEOL-HWAN PARK, UC Berkeley, FELICIANO GIUSTINO, University of Oxford, CATALIN SPATARU, Sandia National Laboratories, MARVIN COHEN, STEVEN LOUIE, UC Berkeley — The lifetime of charge carriers through inelastic scattering processes determines transport properties of electronic devices operating at a high source-drain bias voltage at which the inelastic carrier mean free path is much shorter than the elastic one. Therefore, knowing the carrier lifetime arising from inelastic scattering processes is an important step towards the electronic device applications. We present a first-principles calculation of the carrier lifetime in graphene and bilayer graphene considering both electron-electron and electron-phonon interactions. We also compare our calculated results with recent ultrafast pump-probe optical and angle-resolved photoemission spectroscopy measurements on graphene. The results from these two kinds of experiments appear to contradict with each other.

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