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Light Emission from Graphene Induced by Femtosecond Laser Pulses CHUN HUNG LUI, KIN FAI MAK, JIE SHAN, TONY HEINZ — Since graphene has no band gap, light emission is not expected from relaxed carriers. On the other hand, the strong optical absorption in graphene over a wide spectral range suggests the possibility of hot luminescence from non-equilibrium carriers. Here we report the observation of light emission from monolayer graphene induced by excitation with ultrashort (30-fs) laser pulses. We observe emission throughout the visible spectrum, extending to a photon energy of 3.5 eV in the near UV. In contrast to conventional hot luminescence processes, however, we find strong light emission at photon energies *exceeding* that of the pump laser at 1.5 eV. In addition to detailed measurements of the emission spectra and their dependence on pump fluence, we have performed ultrafast time-domain correlation technique in which light emission is measured as a function of the temporal separation between a pair of femtosecond excitation pulses. A dominant relaxation time of a few 10's of fs is observed. The origin of this unusual light emission process and its relation to the underlying carrier dynamics in graphene will be discussed.

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