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**Ultrafast carrier dynamics in graphene** ADAM ROBERTS, University of Arizona, JOHN FOREMAN, HENRY EVERITT, Army Aviation and Missile RD&E Center, ARVINDER SANDHU, University of Arizona — Prior investigation of carrier dynamics in graphene has been limited to the linear regime in graphene's band structure. In this regime the electrons are strongly coupled to phonons and relaxation takes place in the 100s of femtoseconds. We have investigated electronic relaxation from the saddle point in graphene, which shows a remarkably different behavior. At the saddle point, electronic relaxation takes place in the 100s of picoseconds. This timescale is on the order of coupling between the acoustic phonon modes in graphene with the underlying substrate, which supports the graphene sample. We compare the dynamics between the two different regimes in graphene and discuss the role played between the electron phonon interaction in these limits.

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