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**Electron-phonon interaction and valley splittings in graphene** W. Y. RUAN, JIA-AN YAN, LI YANG, M. Y. CHOU, School of Physics, Georgia Institute of Technology — Based upon first-principles calculations, a two-valley effective mass theory has been developed for graphene in a strong magnetic field and the electron-phonon couplings calculated using density-functional perturbation theory. We showed that the electron interaction with phonons about the Brillouin zone corners can lead to valley-splittings which increases linearly with the magnetic field, in agreement with a recent experimental observation.

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