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Electron-Phonon Coupling in Alkali Doped Bilayer Graphene Studied by ARPES JAMES KLEEMAN, Tohoku University, KATSUAKI SUGAWARA, Tohoku University WPI, TAKAFUMI SATO, Tohoku University, TAKASHI TAKAHASHI, Tohoku University, Tohoku University WPI — Graphene intercalation compounds are a class of materials consisting of stacked graphene sheets, with dopant adatoms ordered in-between them. These materials exhibit an unusual superconducting state, for which characteristic electron-phonon coupling has been suggested. Recent advances in angle-resolved photoemission spectroscopy (ARPES) have enabled high precision measurement of electron-phonon coupling in GICs. Coupling at the graphite-derived π bands was found to be highly anisotropic in the GIC KC_8, being much stronger in the K-M than K-Γ directions [1]. This unusual anisotropy is not predicted by previous superconducting theories. A much smaller anisotropy has also been seen in recent studies of K-doped graphene monolayers [2]. In order to examine the presence of anisotropic coupling in the graphene-metal system, we have performed ARPES on the bilayer graphene GIC [3]. We have found that C_8RbC_8 exhibits strong, anisotropic coupling, similar to that in GICs. The origin of this coupling, as well as its relation to possible superconductivity in ultrathin GICs is discussed.

[1] Grüneis, A., et al. Phys. Rev. B, 79(20), 1-9 (2009).
[2] D. Haberer, et al. Phys. Rev. B 88, 081401 (2013).
[3] Kleeman, J., et al. Phys. Rev. B, 87(19), 195401 (2013)

Thomas Kleeman
Tohoku University

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