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kz Dependent Electronic Structure Studies of CaC6 and Inter Layer State Driven Superconductivity WONSHIK KYUNG, Yonsei Univ, YEONGKWAN KIM, Advanced light source, GARAM HAN, CHOONSHIK LEEM, CHUL KIM, YOONYOUNG KOH, BEOMYOUNG KIM, Yonsei Univ, YEONG-WOOK KIM, JUNSUNG KIM, KEUNSU KIM, Postech, ELI ROTENBERG, JONATHAN DENLINGER, Advanced light source, CHANGYOUNG KIM, Yonsei Univ, YONSEI UNIVERSITY TEAM, POSTECH COLLABORATION, ADVANCED LIGHT SOURCE COLLABORATION — We performed angle-resolved photoemission experiments on CaC6 and measured kz dependent electronic structures to investigate the interlayer states. The results reveal a spherical interlayer Fermi surface centered at the Γ point. We also find the graphene driven band possesses a weak kz dispersion. The overall electronic structure shows a peculiar single graphene layer periodicity in the kz direction although CaC6 unit cell is supposed to contain three graphene layers. This suggests that c-axis ordering of Ca has little effect on the electronic structure of CaC6. In addition to CaC6, we also studied the non-superconducting BaC6. For BaC6, the graphene band Dirac point energy is smaller than that of CaC6. Based on data from CaC6 and BaC6, we rule out Cxy phonon mode as the origin of the superconductivity in CaC6, which strongly suggests interlayer state driven supercondutivity.

Wonshik Kyung
Yonsei Univ

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