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**Interlayer spacing of bilayer graphene determined accurately by photon energy dependent photoelectron intensity oscillation** KU-DING TSUEI, CHENG-MAU CHENG, Natl Synchrotron Rad Res Ctr, JUN-HAO DENG, MENG-SHIUNG CHIANG, CHIA-JEN HSU, Natl Tsing Hua University — We have carried out an angle resolved photoemission spectroscopic study on high quality bilayer graphene grown epitaxially on a SiC(0001) surface over a wide range of photon energies from 30 to 130 eV. The band intensities are maximized along the KΓ direction in the first Brillouin while vanishing along the opposite KM direction due to matrix element effect [1]. For bilayer graphene the two valence bands further oscillate in intensity with varying photon energies [2]. We analyze the data by expressing the intensity asymmetry $(I_1\text{-}I_2)/(I_1+I_2)$ for each photon energy thus avoid the uncertainty by comparing band intensities at different photon energies. The intensity asymmetry can be well simulated by a tight-binding model which attributes the intensity oscillation to the interference of photoelectron amplitudes emitted from the two layers. The oscillation period thus provides an accurate measure of the interlayer spacing. The obtained interlayer spacing is very near that of graphite from literature. [1] E. L. Shirley et al., Phys. Rev. B 51, 13614 (1995). [2] T. Ohta et al., Phys. Rev. Lett. 98, 206802 (2007).

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