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Symmetry breaking in epitaxial graphene probed by ARPES
AARON BOSTWICK, TAISUKE OHTA, JESSICA MCCHESNEY, Lawrence Berkeley National Lab, K. V. EMTSEV, TH. SEYLLER, University of Erlangen, KARSTEN HORN, Fritz Haber Institute, ELI ROTENBERG, Lawrence Berkeley National Lab — The energy bands of n-doped graphene on SiC(0001) have been observed to deviate significantly from the expected conical shape near the Dirac crossing[Bostwick et al 2007, Zhou et al 2007]. Two scenarios have been proposed to explain these deviations, either as originated from the real part of the electronic self-energy due to many body interactions[Bostwick et al], or from "A-B" symmetry-breaking due to chemical interactions between the graphene and the underlying layer[Zhou et al]. In this talk we present a number of arguments against the A-B symmetry breaking scenario, among which is the observed **k**-dependent intensity of the Fermi surface as measured by ARPES. We show that the observed intensity distribution is directly sensitive to the degree of A-B symmetry breaking and show that the upper limit for an energy gap in graphene on SiC is much smaller than the observed deviations in the band structure.

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