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**Silicon Layer Intercalation and Interface Properties between Graphene and Metal hosts** YELIANG WANG, JINHAI MAO, LEI MENG, HONGJUN GAO, Institute of Physics, Chinese Academy of Sciences, JUNFENG HE COLLABORATION, SHIXUAN DU COLLABORATION, XINGJIANG ZHOU COLLABORATION, A. H. CASTRO NETO COLLABORATION[1] — Graphene is being considered as a contender as the reference material with extraordinary properties for a post-CMOS technology. The availability of high quality and large scale single crystal graphene is fundamental for it to fulfill its promise in electronic applications. Graphene is usually grown on a metallic substrate from which it has to be transferred before it can be used. However, uncontrolled shear and strain, associated with the transfer and the presence of extended domains, lead to unavoidable tearing, rendering it useless for scalable production. We propose a way to overcome this bottleneck and produce high quality, free standing graphene by intercalating Si in graphene epitaxially grown on metals, like Ru(0001) & Ir(111). This G/Si/metal architecture, produced by the silicon-layer intercalation approach (SIA), was characterized by STM/STS, Raman, and angle resolved electron photoemission spectroscopy (ARPES) and proves the high structural and electronic qualities of the new composite. The SIA eliminates the need for the graphene transfer and also allows for an atomic control of the distance between the graphene and the metal. References: 1. Jinhai Mao, Yeliang Wang, H.-J. Gao, et al., Appl. Phys. Lett. 100, 093101 (2012) (Cover). 2. Lei Meng, Yeliang Wang, H.-J. Gao, et al., Appl. Phys. Lett. 100, 083101 (2012).

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