Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Direct measurement of the band gaps in graphene on hexagonal boron nitride SUYONG JUNG, HAKSEONG KIM, Korea Research Inst of Standards and Science (KRISS), KOREA RESEARCH INST OF STANDARDS AND SCIENCE (KRISS) TEAM — We have performed electron tunneling spectroscopy measurements on graphene-hexagonal boron-nitride (h-BN) van der Waals heterostructures. In this device scheme, single-layer graphene flake is coupled to a rotationally aligned h-BN substrate and a thin h-BN tunneling barrier is placed on top of the graphene-h-BN stack, which allows us to probe the electronic structures of the graphene superlattice with tunneling spectroscopy measurements as functions of external gate voltage and magnetic field. The superlattice Dirac points are identified as dips in differential conductance plots at both the electron- and hole-doped regions. We have observed that the intrinsic energy gaps are formed at both the superlattice and the main Dirac points, which are confirmed by the development of Landau levels fanning out at the edges of both energy gaps as the external magnetic field increases. We will discuss the intrinsic values and possible origins of the band gaps in graphene superlattice on h-BN substrates.

Suyong Jung
Korea Research Inst of Standards and Science (KRISS)

Date submitted: 11 Nov 2016 Electronic form version 1.4