Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Hexagonal Warping and Quasiparticle Chirality in Silicene Probed by Scanning Tunneling Microscopy BAOJIE FENG, LAN CHEN, KEHUI WU, Chinese Academy of Sci (CAS) — We performed low temperature scanning tunneling microscopy (STM) and spectroscopy (STS) studies on the electronic properties of $(\sqrt{3} \times \sqrt{3})$R30 phase of silicene on Ag(111) surface. We found the existence of Dirac Fermion chirality through the observation of 1.5 and 1.0 power law decay of quasiparticle interference (QPI) patterns. Moreover, in contrast to the trigonal warping of Dirac cone in graphene, we found that the Dirac cone of silicene is hexagonally warped, which is further confirmed by density functional calculations and explained by the unique superstructure of silicene. Our results demonstrate that the $(\sqrt{3} \times \sqrt{3})$R30 phase is an ideal system to investigate the unique Dirac Fermion properties of silicene.

Baojie Feng
Chinese Academy of Sci (CAS)

Date submitted: 18 Oct 2013 Electronic form version 1.4