Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 12.1.2 (E)

Self-Organized Graphene Nanoribbons on SiC(0001) Studied with Scanning Tunneling Microscopy[1] DAVID TORRANCE, BAIQIAN ZHANG, TIEN HOANG, PHILLIP FIRST, Georgia Institute of Technology — Graphene nanoribbons grown directly on nanofacets of SiC(0001) offer an attractive union of top-down and bottom-up fabrication techniques. Nanoribbons have been shown to form on the $< 1\bar{1}0n >$ facets of templated silicon carbide substrates,[2] but also appear spontaneously along step-bunches on vicinal SiC(0001) miscut slightly towards $< 1\bar{1}00 >$. These self-organized graphene nanoribbons were characterized with low-energy electron diffraction (LEED) and Auger electron spectroscopy (AES) in ultra-high vacuum. Our measurements indicate that the graphene forms a continuous "buffer layer" across the SiC(0001) terraces during nanoribbon formation, with the zigzag edge of the buffer layer aligned parallel to the step-bunched nanofacets. Scanning tunneling microscopy/spectroscopy (STM/STS) was used to characterize the topography and electrical characteristics of the graphene nanoribbons. These measurements indicate that the graphene nanoribbons are highly-crystalline with predominantly zigzag edges.

[1]Work supported by the NSF and the NRI-INDEX
[2]Sprinkle et al., *Nat. Nanotech.* **5**, 727 (2010).

[X] Prefer Oral Session
[ ] Prefer Poster Session

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Date submitted: 09 Dec 2011 Electronic form version 1.4