Abstract Submitted
for the NWS12 Meeting of
The American Physical Society

Photoemission electron microscopy of graphene[1] SEBASTIAN SALIBA, Department of Physics, Portland State University, Portland, OR 97201, JENNA WARDINI, Department of Physics, Oregon State University, Corvallis, OR 97331, J.P.S. FITZGERALD, ROBERT C. WORD, Department of Physics, Portland State University, Portland, OR 97201, JOSH KEVEK, Department of Physics, Cornell University, Ithaca, NY 14853, ETHAN MINOT, Department of Physics, Oregon State University, Corvallis, OR 97331, ROLF KOENENKAMP, Department of Physics, Portland State University, Portland, OR 97201 — A study of chemical vapor deposited graphene on copper foil is conducted using an aberration-corrected photoemission electron microscope (PEEM). We demonstrate the efficacy such a PEEM has in identifying multi-layer graphene, defects and cracking. A model is developed to describe the observed reduction in photoemission rate where electrons originate from the copper foil and scatter through the graphene. A survey of several multi-layer feature line profiles demonstrates the reduced photoemission rate as the number of graphene layers increases. A mean-free-path length of $l = 3.8 \pm 0.8$ nm is inferred assuming the layer spacing in graphene is $\Delta z = 0.35$ nm. The PEEM's high spatial resolution and surface sensitivity combined with no electron beam damage are promising for characterizing biosensors and other nanoscale graphene devices.

[1]This research was funded by the US Department of Energy Basic Science Office under contract DE-FG02-10ER46406.

Sebastian Saliba
Department of Physics, Portland State University, Portland, OR 97201

Date submitted: 19 Sep 2012 Electronic form version 1.4