Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Local Force Interactions and Image Contrast Reversal on Graphite Observed with Noncontact Atomic Force Microscopy OMUR DAGDEVIREN, JAN GOETZEN, ERIC ALTMAN, UDO SCHWARZ, Yale University — Surface interactions of graphene-based nanostructures remain a topic of considerable interest in nanotechnology. Similarly, tip-dependent imaging contrasts have attracted attention as they allow conclusions to be made about the surface's chemical structure and local reactivity. In this talk, we present noncontact atomic force microscopy data recorded in the attractive regime on highly oriented pyrolytic graphite that reveals image contrast reversal for the first time. While larger tip-sample separations feature bright spots on atomic sites, the maximum of the tip-sample interaction flips to the hollow site positions upon further approach, which represents the contrast predominantly observed in previous studies during attractive-mode imaging. This cross over of the local chemical interaction is confirmed in force spectroscopy experiments. The results will be discussed in light of recent theoretical simulations that have predicted the occurrence of such contrast reversal for specific tip terminations.

Omur Dagdeviren
Yale University

Date submitted: 05 Nov 2015 Electronic form version 1.4