

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Work function measurements via STM and TS on clean fresh cleaved HOPG and Gold thin films on HOPG under ambient conditions.¹

ROMAN MARIJCZUK, CASEY MOREAN, INDRAJITH SENEVIRATHNE, Department of Geology Physics Lock Haven University — Stability and homogeneity of HOPG has enabled it to be used as a platform for various applications in understanding many physical and chemical phenomena. Novel emergence of graphene as a derivative of graphite also makes HOPG an interesting system to study. This is an ambient investigation of HOPG and Au thin films (ranging about 20nm) surfaces via Scanning Tunneling Microscopy (STM) and Tunneling Spectroscopy (TS) with a Pt-Ir tip equipped Nanosurf Naio STM. In this investigation, clean fresh cleaved HOPG substrates were used. Surfaces of HOPG and Au sputter deposited at different film thicknesses were imaged via constant current mode to assess the surface consistency and roughness. Consistent atomic resolution images were obtained. The same systems were then investigated via TS by tunneling current (I) vs. height (z) curves. These spectroscopic data were then used to assess the localized work function measurements and surface variation of the work function. The discussion will attempt to assess the surface electronic environment of these systems in relation to the Au deposition and variation of Au thickness on HOPG. Ambient measurements will inherently complicate these measurements and the complexities will also be discussed.

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Date submitted: 05 Nov 2015

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