## Abstract Submitted for the MAR17 Meeting of The American Physical Society

Graphene oxide based contacts as probes of biomedical signals<sup>1</sup> N. G. HALLFORS, A. DEVARAJAN, I. A. H. FARHAT, A. ABDURAHMAN, K. LIAO, D. L. GATER, M. I. ELNAGGAR, A. F. ISAKOVIC, Khalifa University, Abu Dhabi, UAE — We have developed a series of graphene oxide (GO<sub>x</sub>) on polymer contacts and have demonstrated these to be useful for collection of standard biomedically relevant signals, such as electrocardiogram (ECG). The process is wet solution-based and allows for control and tuning of the basic physical parameters of GO<sub>x</sub>, such as electrical and optical properties, simply by choosing the number of GO<sub>x</sub> layers. Our GO<sub>x</sub> characterization measurements show spectral (FTIR, XPS, IR absorbance) features most relevant to such performance, and point towards the likely explanations about the mechanisms for controlling the physical properties relevant for the contact performance. Structural (X-ray topography) and surface characterization (AFM, SEM) indicates to what degree these contacts can be considered homogeneous and therefore provide information on yield and repeatability. We compare the ECG signals recorded by standard commercial probes (Ag/AgCl) and GO<sub>x</sub> probes, displaying minor differences the solution to which may lead to a whole new way we perform ECG data collection, including wearable electronics and IoT friendly ECG monitoring.

<sup>1</sup>We acknowledge support from Mubadala-SRC AC4ES and from SRC 2011-KJ-2190. We thank J. B. Warren and G. L. Carr (BNL) for assistance.

N. G. Hallfors Khalifa University, Abu Dhabi, UAE

Date submitted: 06 Nov 2016 Electronic form version 1.4