Abstract Submitted
for the NES15 Meeting of
The American Physical Society

Altering the Optical Properties of Reduced Graphene Oxide by Ozone Treatment NICHOLAS LOMBARDO, CALEB MALONEY, KATHARINE HESSE, ANTON NAUMOV, Central Connecticut State University — Due to its remarkable properties, graphene has found multiple applications in optics and electronics. The advancement of graphene-based optoelectronics is dependent on the ability to controllably produce band gaps in graphene. In this work, controlled ozone treatment of reduced graphene oxide (RGO) in water suspensions was employed in order to functionalize it with oxygen-containing groups, yielding graphene oxide (GO). As a result of such processing, a broad fluorescence feature centered at $\sim$ 532 nm was detected from the product, indicating the formation of the optical band gap in previously non-emissive RGO. The fluorescence intensity could be varied by the ozone treatment time, which provides a possibility of controlled modification of graphene oxide optical properties. Theoretical PM3 modeling of functionalized graphene sheets suggests that such fluorescence could arise due to confinement effects or oxygen group-induced defect states in GO.

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Date submitted: 09 Apr 2015 Electronic form version 1.4