

Abstract Submitted
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**Efros-Shklovskii Variable Range Hopping in Reduced
Graphene Oxide Sheets**

DAEHA JOUNG, Nanoscience Technology Center and Department of Physics, University of Central Florida, SAIFUL I. KHONDAKER, Nanoscience Technology Center, Department of Physics, School of Electrical Engineering and Computer Science, University of Central Florida — Reduced graphene oxide (RGO) sheets consist of highly ordered graphene domain and structural defects including oxidized carbon atoms and topological defects. Charge transport properties of RGO sheets are strongly influenced by the degree of disorderliness which can be tuned by varying the amount of the reduction. We studied the hopping conduction of the RGO sheets with different reduction efficiency. We show that the low temperature charge transport properties of the RGO with various reduction efficiency can be well described by Efros-Shklovskii variable range hopping (ES VRH), $\rho \sim \exp[-(T/T)^{1/2}]$. We will discuss how the localization length varies with the degree of reduction. The result indicates that the coulomb interactions between graphene domains play an important role in the charge transport of the RGO sheets.

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