Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Experimental investigation of carrier quantum confinement in graphene quantum dots and nanoribbons KIRAN LINGAM, RAMAKRISHNA PODILA, APPARAO RAO, Department of Physics and Astronomy, Clemson University, CLEMSON UNIVERSITY TEAM — Recently, Zhu *et al.* (Chem. Comm., 2011. **47**(24), 6858) and Pan *et al.* (Adv. Mat., 2010. **22**(6), 734) have successfully synthesized graphene quantum dots (width <10 nm). They probed the carrier quantum confinement in such GQDs using photoluminescence spectroscopy (PL). However, a self-consistent explanation for the observed PL spectra is lacking. Interestingly, we find that the organic reducing agents used for synthesizing GQDs have PL signature similar to the GQDs themselves. Thus, deconvoluting solvent effects is extremely important to achieve further progress in synthesis and application of GQDs. We studied the PL behavior of hydrothermally synthesized graphene nanoribbons (GNRs) and GQDs to understand the solvent effects and the underlying mechanism for the observed PL. We will discuss the effects of size, shape and morphology on the PL behavior of GQDs and GNRs.

Kiran Lingam
Department of Physics and Astronomy, Clemson University

Date submitted: 20 Nov 2011 Electronic form version 1.4