Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Evidence for magnetic behavior in chemically modified graphene
JOEL THERRIEN, KYLE TWAROWSKI, ECE, U. Massachusetts Lowell, VAIBHAV MATHUR, Physics, U. Massachusetts Lowell, ANTONIO H. CASTRO-NETO, Physics, Boston University — Although graphene has exceptional electronic and structural properties, there is very little experimental evidence that graphene by itself shows strong electron-electron correlations. In fact, in spite of a large amount of theoretical work, recent experiments have shown that pure and clean graphene shows no signs of correlated many-body states such as magnetism or superconductivity. We will report on the observation of room temperature magnetism in mechanically exfoliated, chemically modified, graphene. The effect has been found using both magnetic force microscopy and magnetization tests. It was shown that the graphene can be brought back to a non-magnetized state by removing the surface chemistry. The search for correlated electronic states in graphene generates an enormous interest because of its low dimensionality, which is prone to strong quantum and thermal effects, and also because it would open up doors for a plethora of technological applications, from permanent two-dimensional magnets to spintronics.

Joel Therrien
ECE, U. Massachusetts Lowell

Date submitted: 24 Nov 2010 Electronic form version 1.4