Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Th Q1 e thermal stability of graphene in air investigated by Raman spectroscopy HAIYAN NAN, ZHENHUA NI, JUN WANG, ZAINAB ZAFAR, ZHIXIANG SHI, Department of Physics, Southeast University, Nanjing 211189, China, YINGYING WANG, Department of Optoelectronic Science, Harbin Institute of Technology at Weihai, Weihai 264209, China, GRAPHENE TEAM — The thermal stability in air of graphene synthesized by either chemical vapor deposition or mechanical cleavage is studied. It is found that single layer graphene prepared by both methods starts to show defects at ∼500 °C, indicated by the appearance of a disorder-induced Raman D peak. The defects are initially sp3 type and become vacancy like at higher temperature. On the other hand, bilayer graphene shows better thermal stability, and the D peak appears at ∼600 °C. These results are quite different from those annealing in vacuum and controlled atmosphere. Raman images show that the defects in chemical vapor deposition graphene are not homogeneous, whereas those in mechanical cleavage graphene are uniformly distributed across the whole sample. The factors that affect the thermal stability of graphene are discussed. Our results could be important for guiding the future electronics process and chemical decoration of graphene.

Haiyan Nan
Department of Physics, Southeast University, Nanjing 211189, China

Date submitted: 12 Nov 2013 Electronic form version 1.4