Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

The Effect of Cluster Formation on Graphene Mobility KATHLEEN MCCREARY, KYLE PI, ADRIAN SWARTZ, WEI HAN, WENZHONG BAO, JEANIE LAU, UC Riverside, FRANCISCO GUINEA, Instituto de Ciencias de Materiales de Madrid, CSIS, MIKHAIL KATSNELSON, Institute for Molecules and Materials, Radboud University of Nijmegen, SHAN-WEN TSAI, ROLAND KAWAKAMI, UC Riverside — The transport properties of graphene are strongly influenced by the presence of impurities on the surface. Additionally, the structure of the impurities, whether in the form of clusters or isolated adatoms, has an effect on scattering. Using molecular beam epitaxy, small amounts of gold impurities are introduced to the graphene surface. When deposited at low temperatures, the resulting decrease in mobility and a shift in Dirac point is consistent with scattering from point-like charged impurities. To investigate the effect of the formation of clusters, the temperature is slowly raised to room temperature while transport properties are monitored. For a fixed amount of gold impurities, it is discovered that the formation of clusters significantly enhances the mobility and causes the Dirac point to shift back toward zero.

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Date submitted: 14 Dec 2009 Electronic form version 1.4