Abstract Submitted
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Tuning the Kondo effect in graphene in the presence of point defects[1] JINHAI MAO, YUHANG JIANG, GUOHONG LI, EVA Y. ANDREI, Department of Physics and Astronomy, Rutgers University, DEPARTMENT OF PHYSICS AND ASTRONOMY, RUTGERS UNIVERSITY TEAM — Removing a single carbon atom from the honeycomb lattice in graphene produces a localized state orthogonal to the undisturbed lattice states. According to theory this will give rise to a local magnetic moment when occupied by an electron, but its fate in the presence of conduction electrons is not known. Will it be screened by many body interactions below a critical Kondo temperature to form a singlet state, or will it remain unscreened? Recent studies using transport or magnetic measurements on graphene in the presence of point disorder have reached opposite conclusions 1,2. We addressed this question by combining STM and transport measurements to study the effect of interactions between the electrons in graphene and local magnetic moments as a function of carrier density and dielectric environment. At high density we observe a clear signature of Kondo screening in the form of a Fano resonance in the density of state that is pinned to the Fermi energy and splits in a magnetic field. We further find that the Kondo temperature strongly depends on the carrier density and that it can be tuned in or out with a gate voltage. 1. Chen, J. H., et.al, Nature Physics 7, 535–538 (2011) 2. Nair, R. R., et. al, Nature Physics 8, 199–202(2012)

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