Abstract Submitted
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**Tunable superconductivity in decorated graphene**[1] ZHENG HAN, ADRIEN ALLAIN, LAETITIA MARTY, NEDJMA BENDIAB, PIERRE TOULEMONDE, PIERRE STROBEL, JOHANN CORAUX, VINCENT BOUCHIAT, Neel Institute, CNRS-Grenoble, 38042 Grenoble, France — Graphene offers an exposed bidimensional gas of high mobility charge carriers with gate tunable density. Its chemical inertness offers an outstanding platform to explore exotic 2D superconductivity. Superconductivity can be induced in graphene by means of proximity effect (by depositing a set of superconducting metal clusters such as lead [1] or tin nanoparticles). The influence of decoration material, density or particles and disorder of graphene will be discussed. In the case of disordered graphene, Tin decoration leads to a gate-tunable superconducting-to-insulator quantum phase transition [2]. Superconductivity in graphene is also expected to occur under strong charge doping [3] (induced either by gating or under chemical decoration [4], in analogy with graphite intercalated compounds). I will also show preliminary results showing the influence of Calcium intercalation of few layer graphene and progress toward the demonstration of intrinsic superconductivity in such systems. [1] B. Kessler et al, Phys. Rev. Lett., **104**, 047001 (2010). [2] A. Allain et al, Nature Materials, **11** , 590 (2012). [3] B. Uchoa and A. H. Castro Neto. Phys. Rev. Lett., **98**, 146801 (2007). [4] G. Profeta, et al., Nature Physics **8**, 131 (2012).

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