

# Scanning probe exploration of exfoliated graphene on SiO<sub>2</sub> and epitaxial graphene on Ru(0001) in magnetic field

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In the first part of this talk I will give account of our work on scanning probe studies of exfoliated graphene on silicon oxide in ambient conditions. In the second part will deal with the spectroscopic exploration of epitaxial graphene on Ru(0001) at low temperatures.

## **1. Local Charges and Screening in Exfoliated Graphene on SiO<sub>2</sub>**

The corrugation observed in single layer graphene STM images is much higher than that observed in few layer of graphene. This is also the case for the apparent tunneling barrier which strongly suggests that the observed corrugation is mainly due to trapped charges on the silicon oxide substrate and not to adsorbates. Using a combined STM/nCAFM microscope, we study the screening of the electric field by graphene as a function of the number of layers and of gate voltage.

## **2. Epitaxial graphene on Ru(0001) in magnetic field**

Using a scanning tunneling microscope at low temperatures (300 mK), we explore the effect of magnetic fields of up to 8 T. We find no features related to magnetic field. The fact that the differential conductance curves present a large conductance at low bias with only a shallow minimum and no magnetic field dependence shows that the graphene layer is strongly coupled to the substrate. In addition we observe a clear feature at 360 mV, consistent with inelastic effects.