Abstract Submitted
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Magnetotransport in Graphene on the Nano Scale measured by Scanning Tunneling Potentiometry[1] PHILIP WILLKE, THOMAS DRUGA, THOMAS KOTZOTT, RAINER ULBRICH, Univ Goettingen, ALEXANDER SCHNEIDER, Univ Erlangen-Nuernberg, MARTIN WENDEROTH, Univ Goettingen — The method of scanning tunneling potentiometry (STP) has been introduced by Muralt and Pohl [1] as a technique for mapping the electrochemical potential locally. Here we present a new home-built low-temperature STP setup with applicable magnetic field of up to 6T to study the spatial evolution of the voltage drop at extended defects in graphene with high-resolution.[2] We show that the voltage drop at a monolayer-bilayer boundary in graphene clearly extends spatially up to a few nanometers into the bilayer and hence is not located strictly at the structural defect. Moreover, different scattering mechanisms can be disentangled. Besides, we perform magnetotransport STP measurements mapping the local electrochemical potential as a function of the applied magnetic field. This allows us to identify localized and delocalized contributions to the magnetoresistance in epitaxial-grown graphene and to reveal the contribution of defects. [1] P. Muralt, D. W. Pohl, Scanning tunneling potentiometry, Appl. Phys. Lett.. 48, 514 (1986) [2] P. Willke, et al. Spatial Extent of a Landauer Residual-Resistivity Dipole in Graphene quantified by Scanning Tunneling Potentiometry, Nature Commun. 6, 6399 (2015)

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