Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Highest resolution Confocal Raman-AFM-SNOM: Advantages and new insights for Graphene characterization WEI LIU, UTE SCHMIDT, THOMAS DIEING, WITec, WITEC TEAM — An important goal of graphene study is precisely determining the number of layers forming the graphene flake. The aim of this contribution is to show how the confocal Raman AFM - SNOM can contribute to the characterization of graphene. In the past two decades, AFM (Atomic Force Microscopy)was one of the main techniques used to characterize the morphology of nano-materials. From such images it is possible to gain information about the physical dimensions of the material, but not their chemical composition, crystallinity or stress state. On the other hand, Raman spectroscopy is known to be used to unequivocally determine the chemical composition of a material. By combining the chemical sensitive Raman spectroscopy with high resolution confocal optical microscopy, the analyzed material volume can be reduced below 0.02 μm^3, thus leading to the ability to acquire diffraction limited resolution Raman images. Furthermore, using SNOM (Scanning Near-field Optical Microscopy) technology, it will be shown for the first time how the transparency of different graphene sheets is changing as a function of the number of layers. The combination of confocal Raman microscopy with AFM and SNOM is a breakthrough in microscopy. Using such a combination, the topographic information obtained with an AFM can be directly linked to the chemical information provided by confocal Raman and transparency properties obtained with SNOM.

Wei Liu
WITec

Date submitted: 13 Nov 2013 Electronic form version 1.4