

High Speed – Large Area – Non destructive Graphene Characterization

David Etayo⁽¹⁾, Alex Lopez⁽¹⁾, Magdalena Chudzik⁽¹⁾, Luis E. Hueso⁽²⁾, Amaia Zurutuza⁽³⁾, Javier Tejada⁽⁴⁾, Eduardo Azanza⁽¹⁾.

(1)das-Nano, Polígono Industrial Mutilva Baja Calle G-6. E-31192 Mutilva Baja, Navarra. Spain

(2)CIC nanoGUNE. Tolosa Hiribidea, 76. E-20018 Donostia-San Sebastián, Spain

(3)Graphenea. Tolosa Hiribidea, 76. E-20018 Donostia-San Sebastián, Spain

(4) Dept. Física Fundamental, Universitat de Barcelona. C. de Martí i Franquès, 1,08028 Barcelona, Spain

detayo@das-nano.es

Abstract

In this paper we will present a new, ultra-fast device (Figure 1) for quality inspection of thin film materials. This machine inspects and determines the quality of thin film materials such as graphene (mono-layer and multilayer), PEDOT or ITO by a repeatable and reproducible [1] measurement process. The materials cited above are currently characterized by nano-scale tools (such as confocal Raman Spectroscopy, Atomic Force Microscopy or Transmission Electron Microscopy), and/or macro-scale methods (for example van der Pauw resistivity technique or optical microscopy) [2]. Our Thin Film Inspector covers the gap between the nano-scale tools and the macro-scale methods allowing the ultra-fast determination of the existence of inhomogeneities in the material.

Our Thin Film Inspector is non-invasive (metallic contacts are not required), non-destructive (thin film material is not modified) and non-ionizing. Furthermore, our Thin Film inspector can measure the full area of the sample under examination and provide a quality map (Figure 2) at a very high speed (over 10.000 mm², @ 1 mm² resolution), and with a spatial resolution of 100 μm.

References

[1] Rouhi et al., Nano Research, (2012), **Volume 5, Issue 10**, pp 667-678

[2] Buron et al., Nano Letters (2012), **Volume 12 Issue 10**, pp 5074–5081

Figures



Figure 1. Thin Film Inspector

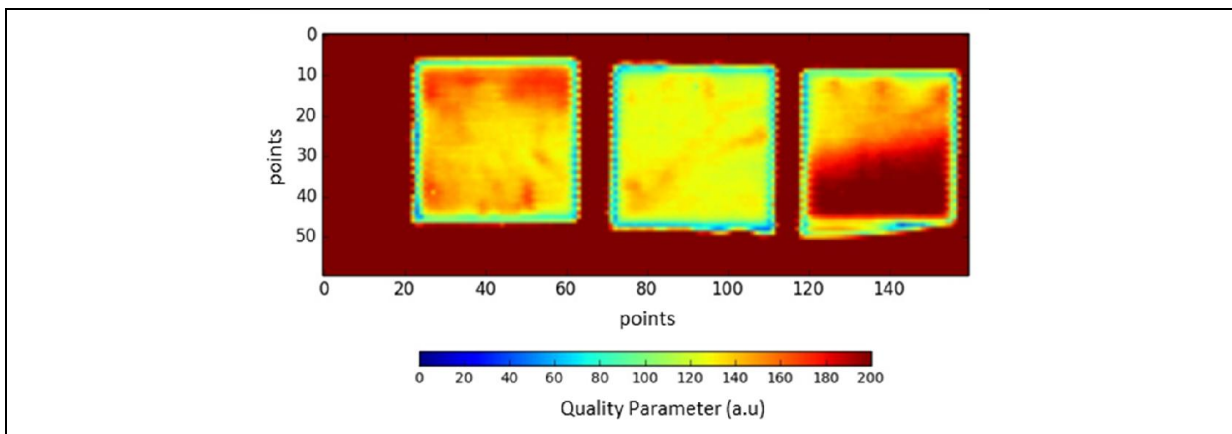


Figure 2. Quality maps of several samples of Monolayer Graphene