# ELLIPSOMETRIC ANALYSIS OF ALIGNED CARBON NANOTUBES

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Vertically aligned carbon nanotube (CNT) carpets combined with inorganic semiconductors are expected good prospect in practical applications, especially in photocatalysis. If these devices are in production, a fast and non-invasive characterization method will be required. Ellipsometry is widely used in industry as an in-line monitoring tool; therefore in this study the applicability of ellipsometry for characterizing CNT carpets is investigated.
Although the nanotubes are relatively far from each other meaning that the structure contains a lot of voids and the surface of the CNT carpet has very weak reflectivity, we could perform ellipsometric measurements on the side of the CNT carpet at different CNT orientations (Fig. 1). Due to the aligned growth of individual nanotubes, these structures exhibit strong anisotropy. It is shown based on anisotropic EMA model, that ellipsometric evaluation can provide information about the density and the optical properties of the nanotubes. However, the properties of the individual nanotubes (diameter, wall number) can not be taken into account during conventional ellipsometric modeling. To overcome these limitations, numerical simulations will also be presented [1].

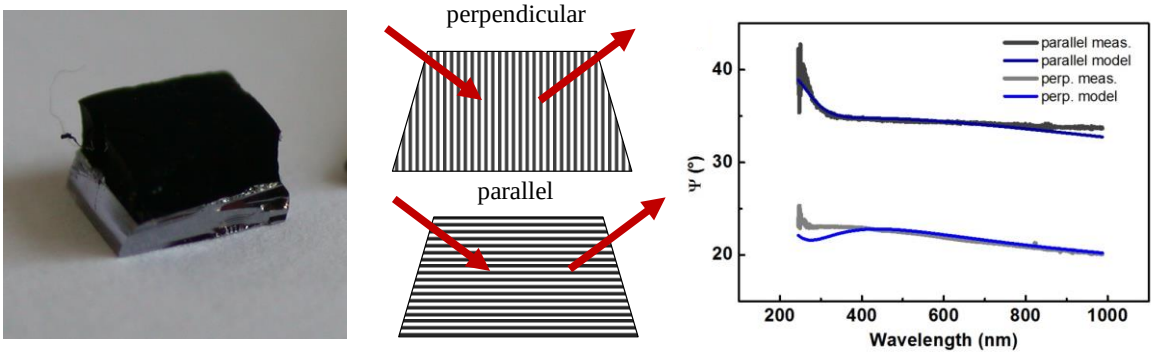


Fig. 1. Image of the investigated CNT carpet, measurement scheme and modeling with anisotropic EMA

*Keywords:* Vertically aligned CNT; Nanostructures; Anisotropy; Numerical methods

**References**

[1] Z. Pápa, E. Kecsenovity, J. Csontos, A. Szabó, Z. Toth, J. Budai, Journal of Nanoscience and Nanotechnology, submitted