

Imaging of C60 and other structures in graphene sandwiches by automated low-dose transmission electron microscopy

Kevin Strobel^{a,b}

Jannik C. Meyer^{a,b}, Michael Schlegel^{a,b}

^aInst. of App. Phys., Univ. of Tuebingen, Auf der Morgenstelle 10, D-72076, Tuebingen, Germany

^bNat. and Med. Sciences Inst. at the Univ. of Tuebingen, Markwiesenstr. 55, D-72770 Reutlingen, Germany

kevin.strobel@uni-tuebingen.de

We studied thin layers of C60, chlorinated copper phthalocyanine, and NaCl deposited on graphene and encapsulated into graphene sandwiches by atomic-resolution, aberration corrected transmission electron microscopy. Since the information gained from a radiation sensitive specimen is limited by the introduced dosage, a low-dose acquisition approach was developed, where always a fresh region of a sample is exposed (without prior exposure for focusing or tuning) (Fig. 1). Besides imaging of the pristine structures (Fig. 2), C60 molecules inside the graphene sandwich could be heated to very high temperatures, as the sandwich prevents evaporation of the molecules.

Figures

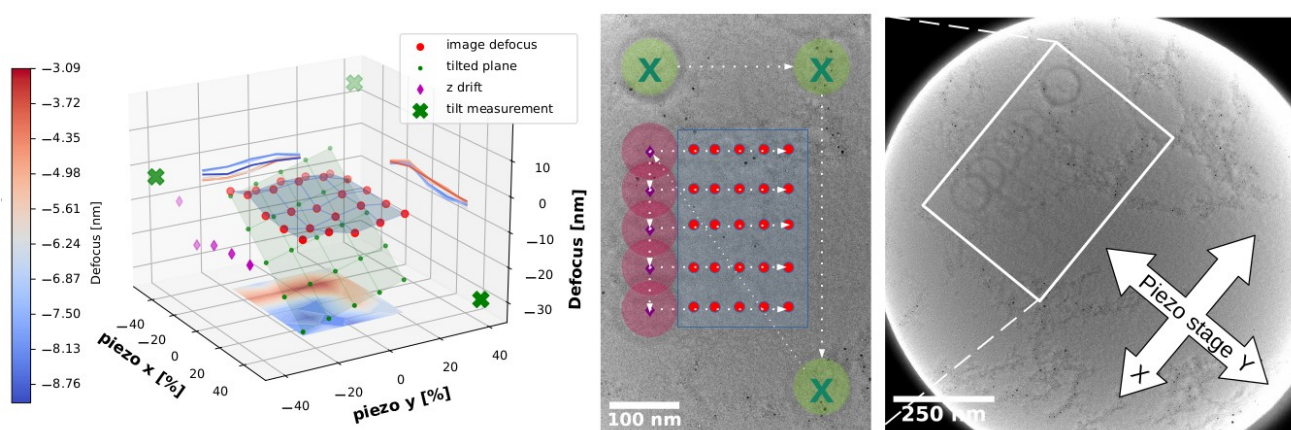


Figure 1: Automated Image Mapping using the piezo stage of a JEM-ARM200F with automated stigma and defocus correction. The measured defocus with and without defocus compensation is shown on the left and the mapping area of a C60 film on Graphene is shown on the right.

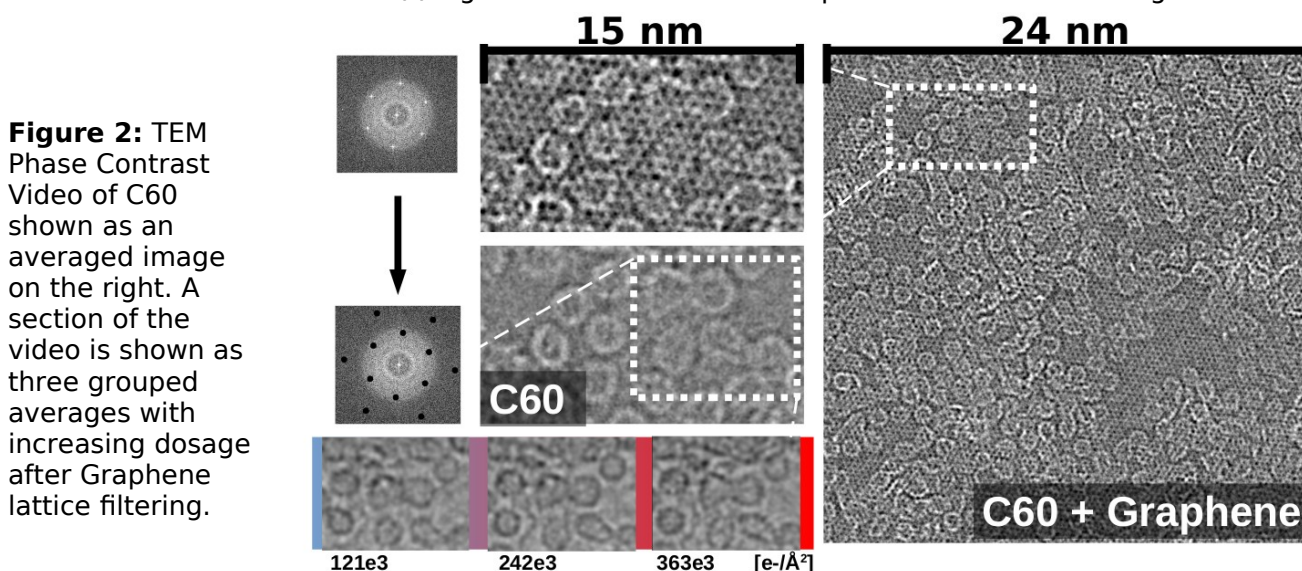


Figure 2: TEM Phase Contrast Video of C60 shown as an averaged image on the right. A section of the video is shown as three grouped averages with increasing dosage after Graphene lattice filtering.