

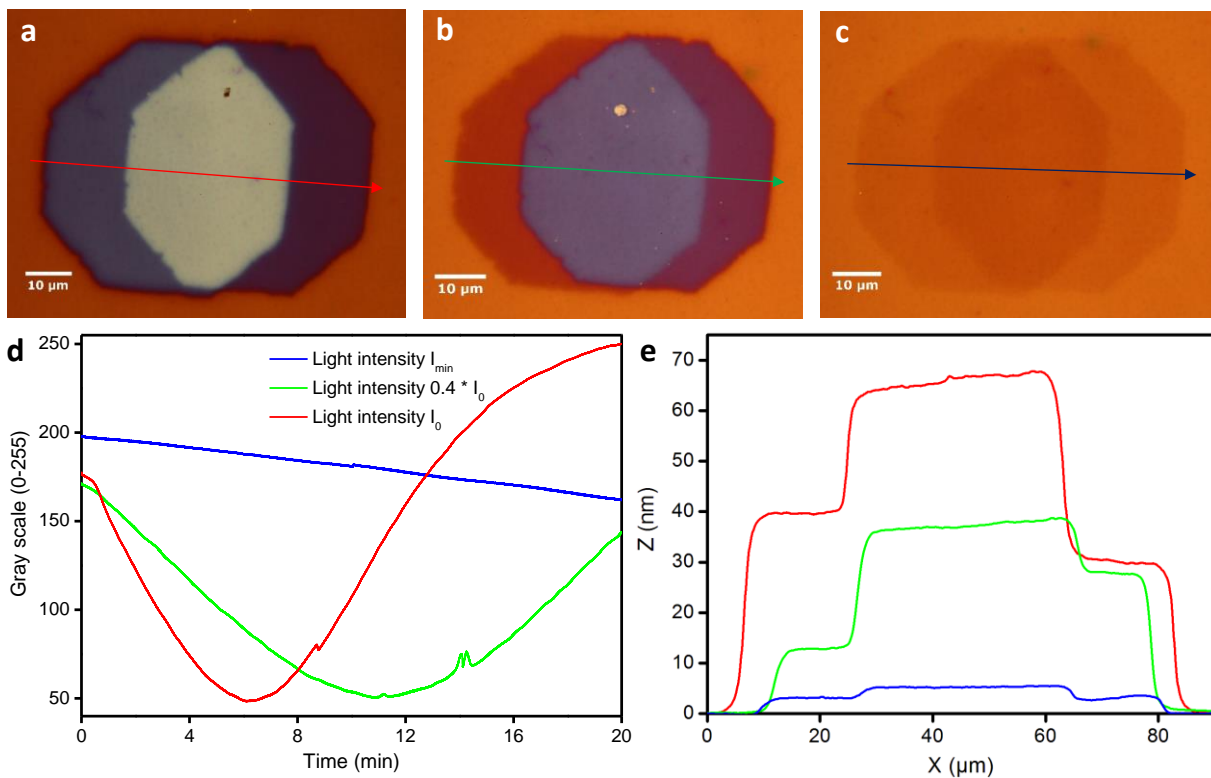
# Ideal optical contrast for 2D materials observation using bi-layer antireflection absorbing substrates

## ELECTRONIC SUPPLEMENTARY INFORMATION (ESI)

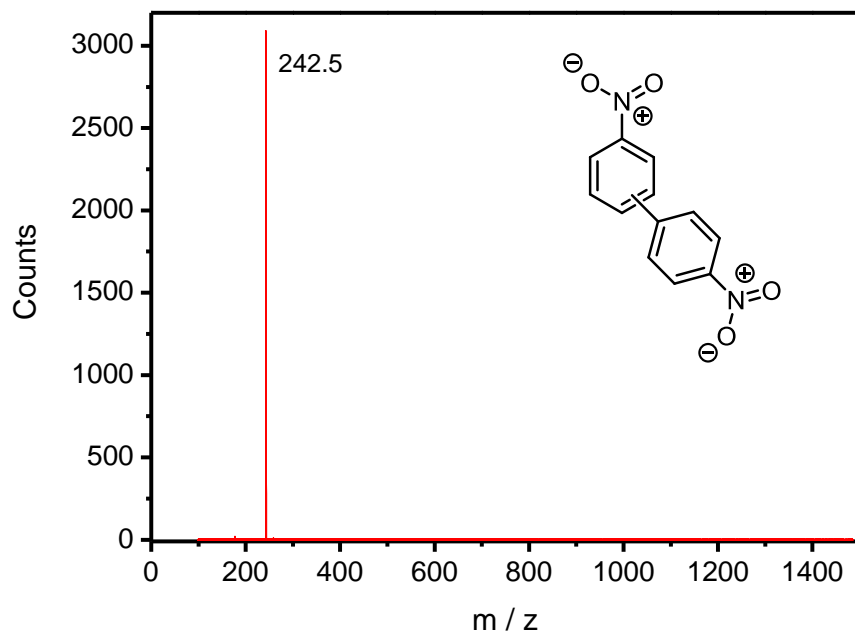
*Kevin Jaouen,<sup>1</sup> Renaud Cornut,<sup>1,\*</sup> Dominique Ausserré,<sup>2</sup> Stéphane Campidelli,<sup>1</sup> Vincent  
Derycke<sup>1,\*</sup>*

<sup>1</sup> LICSEN, NIMBE, CEA, CNRS, Université Paris-Saclay, CEA Saclay, F-91191 Gif-sur-Yvette  
Cedex, France. E-mail: [renaud.cornut@cea.fr](mailto:renaud.cornut@cea.fr); [vincent.derycke@cea.fr](mailto:vincent.derycke@cea.fr)

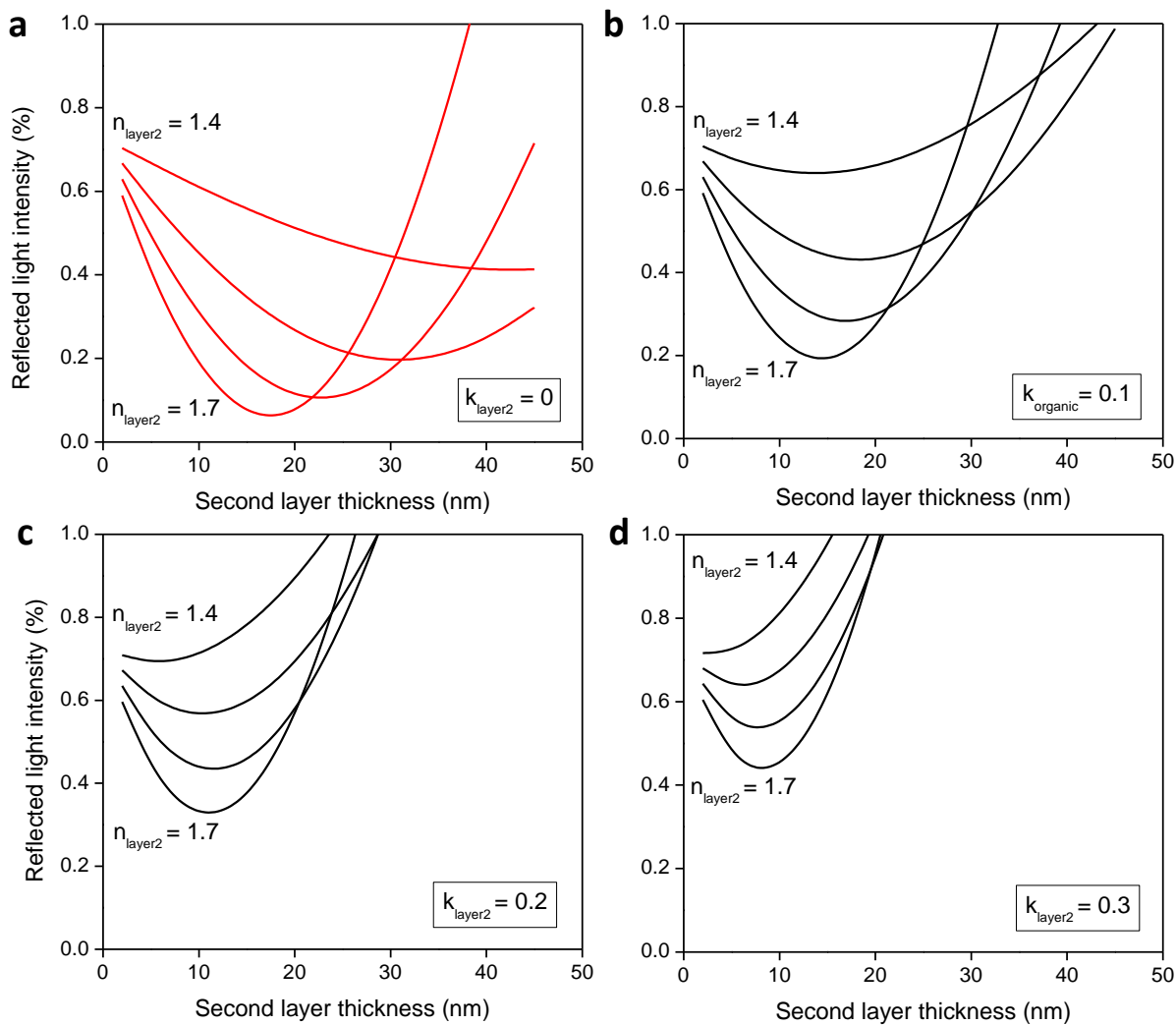
<sup>2</sup> Institut des Molécules et Matériaux du Mans (UMR 6283), Université du Maine, Avenue  
Olivier Messiaen, F-72000 Le Mans, France



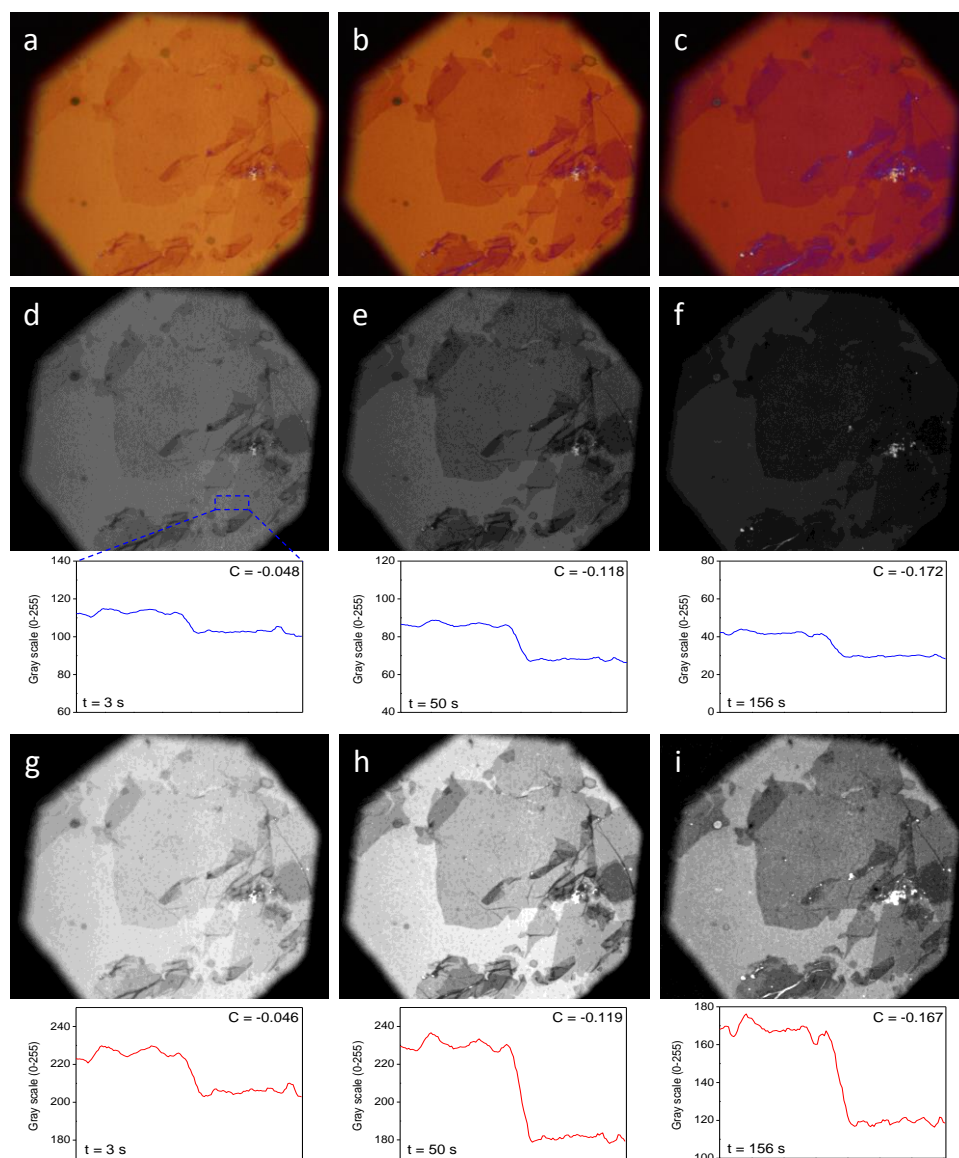
**Figure S1.** (a,b,c) BALM images acquired after the end of the organic layer deposition with the diaphragm fully open. From left to right, the light intensity used during the light-induced deposition of dinitrobiphenyl molecules decreases. The substrate was moved by  $\sim 20\mu\text{m}$  at approximately mid-experiment along the arrow direction. (d) Reflected light as a function of time in the center of the image during the deposition (gray-scale data from the green channel averaged on a  $100 \times 100$  pixels area), (e) AFM height profiles at the end of the experiments.



**Figure S2.** MALDI-TOF mass spectrum of the material resulting from the light induced deposition of 4-nitrobenzenediazonium tetrafluoroborate on gold surface. It shows that the film is constituted of dinitrobiphenyl molecules.



**Figure S3.** Simple numerical simulation of the reflected light intensity (at  $\lambda = 550$  nm and normal incidence) on a 3nm-gold/second-layer stack as a function of the second layer thickness and for different values of  $n_{\text{layer2}}$  (1.4, 1.5, 1.6 and 1.7) for (a)  $k_{\text{layer2}} = 0$ , (b)  $k_{\text{layer2}} = 0.1$ , (c)  $k_{\text{layer2}} = 0.2$  and (d)  $k_{\text{layer2}} = 0.3$ .



**Figure S4** BALM images of GO flakes on gold extracted from a movie (movie\_1 in SI) recorded during the controlled deposition of an organic layer. (a,b,c) RGB color images at  $t = 0$  s,  $t = 50$  s, and  $t = 156$  s respectively. (d,e,f) gray-scale image of the green channel and example of a height profile at a gold/GO step from which the contrast  $C = (I_{GO} - I_{gold}) / (I_{GO} + I_{gold})$  is extracted. (g,h,i) Same images with the 0-255gray scale simply rescaled to 0-128, 0-96, 0-64 for the 3 images respectively. As shown on the height profiles, this simply compensates for the progressive darkening of the images as the reflection decreases, but does not impact contrast values.