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

ELECTRONIC SUPPLEMENTARY INFORMATION (ESI)

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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 ~20µm 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 100x100 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 0-255 gray 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.