Imaging Ellipsometry as a Tool for the Characterization of 2D-Materials on various Substrates

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Imaging ellipsometry (IE) allows to measure ellipsometry on microstructured samples with a lateral ellipsometric resolution down to 1 µm. The rising field of research on 2D materials demands for techniques that enable the measurements on micron-sized flakes of 2D materials. These 2D materials often show superior behavior e.g. in optical response when monolayers are compared to multilayers. By stacking up different 2D materials, promising applications are expected. Fig. 1. shows a hetero-structure of WSe_2 and MoS_2. The poster presentation will show the IE measurements on the regions that can be seen on the SiO_2/Si substrate. In addition, the flakesearch algorithm is presented as a tool for the fast and accurate localization of flakes [1]. Detailed investigations of MoS2 on a thin, transparent sapphire substrate show the shift in the bandgap [2]. Measurements of Graphene directly on Copper-foil show the capability towards the use of imaging ellipsometry in quality control. To cover the anisotropic 2D-materials imaging Mueller-Matrix measurements are done. The in-plane dispersions for a flake of Black-phosphorous are shown.

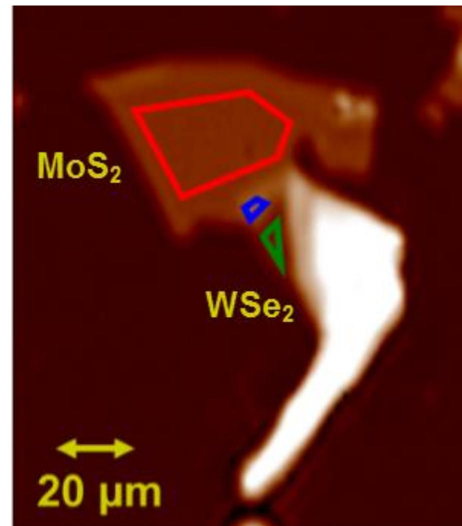

Fig. 1. Imaging ellipsometry of hetero-structure of MoS_2 and WSe_2.

Summing up, the poster presentation will show the capabilities of imaging ellipsometry in the field of 2D materials. Flakes of 2D materials can be found, investigated and orientated on various, including thin, transparent, substrates.

Keywords: Imaging Ellipsometry; Imaging Mueller Matrix, 2D Materials

References

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