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Probing Graphene by Low-Energy Electrons under Non-normal Incidence[1] JOHANNES JOBST, JAAP KAUTZ, DANIEL GEELEN, Leiden University, Huygens-Kamerlingh Onnes Laboratory, RUDOLF M. TROMP, IBM T.J. Watson Research Center, SENSE JAN VAN DER MOLEN, Leiden University, Huygens-Kamerlingh Onnes Laboratory — Low-energy electron microscopy (LEEM) is a powerful surface analysis tool for investigating samples in real and reciprocal space. Moreover, spectroscopic information can be obtained by measuring LEEM-IV, i.e., the energy dependence of the reflected electron intensity. Here, we focus on the study of monolayer and bilayer graphene grown on silicon carbide. Its layered character gives rise to minima in the LEEM-IV, which are used to unambiguously determine the layer thickness as the number of minima is equal to the number of conducting graphene layers. In a typical LEEM experiment it is crucial to align the sample such that the electrons impinge perpendicular on the surface in order to guarantee ideal imaging conditions. In this study we, however, present a systematic analysis of the effect of beam tilt on the LEEM-IV. We find pronounced changes in shape depending on the tilt angle with respect to crystallographic axes. These changes can be related to the band structure of few-layer graphene.

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Johannes Jobst
Leiden University, Huygens-Kamerlingh Onnes Laboratory

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