The role of hBN for high-mobility electron transport at room temperature

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Hexagonal boron nitride plays a crucial role for state-of-the-art high-mobility graphene devices. In this talk, I will focus on the importance of the flatness of substrates for high-quality graphene and bilayer graphene-devices, the role of charge disorder and on the mechanical interlayer coupling [1-5]. In particular, I will discuss recent transport experiments performed on hBN/graphene/hBN heterostructures (see Fig. 1) based on monoisotopic hBN crystals [6] exhibiting differences in the transport properties compared to state-of-the-art hBN/graphene/hBN stacks. Moreover, I will show quantum transport measurements on gapped bilayer graphene [7] focusing on the possibilities to completely pinch of current and on the fabrication technology needed to make use of clean band gaps in hBN/bilayer graphene/hBN devices.

References

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Figures

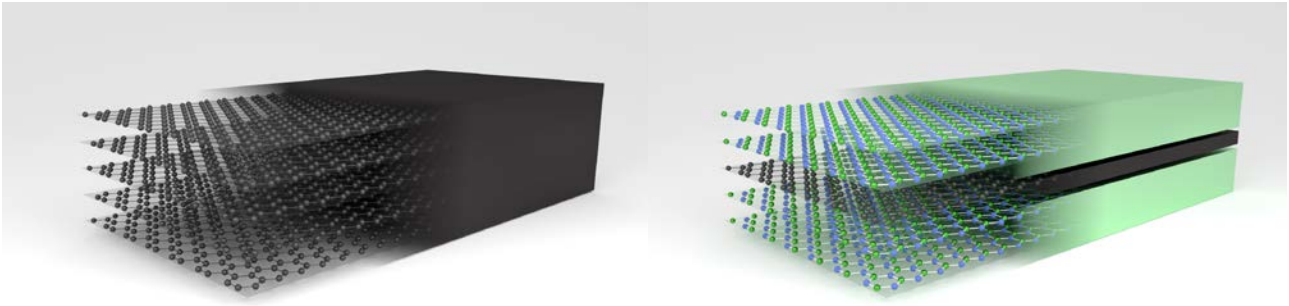

Figure 1: Graphite (left) and hBN/graphene/hBN van der Waals heterostructure (right).