

Effective elastic properties of multilayer graphene

Yun Hwangbo¹

Seong-Jae Jeon¹, Young-Woo Son², Sungjong Woo³.

¹ Korea Institute of Machinery & Materials (KIMM), Daejeon, Republic of Korea

² Korea Institute of Advanced Study (KIAS), Seoul, Republic of Korea

³ Pukyong National University, Pusan, Republic of Korea

ofs7@kimm.re.kr

Abstract

Elastic properties such as the Grüneisen parameter and Young's modulus of multilayer graphene are systematically investigated. *In-situ* AFM and Raman bugle tests show that the apparent elasticity of graphene decreases as the number of layers increases, while our *ab initio* theoretical prediction shows almost no dependence on the number of layers. We find that such discrepancy is attributed to incomplete stress transfer across the graphene layers under typical experimental conditions. We have developed a comprehensive theoretical model that can better simulate the actual situations which is further developed from the model for bilayers suggested in Ref [1].

References

[1] Guorui Wang *et al.*, Phys. Rev. Lett, 119 (2017) 036101

Figures

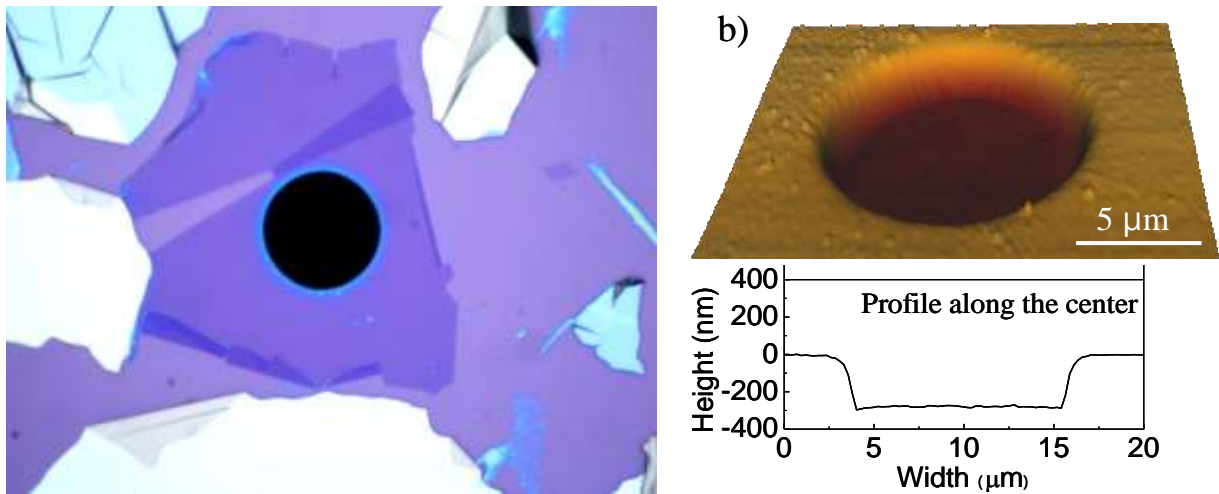


Figure 1: Fig. 1. Optical and AFM images of multilayer graphene for this study.