

Elastic Properties and Strain-Induced Buckling of 2-Dimensional Materials

Interface strain exists very commonly in layered structures, particularly at a hetero-interface of two different materials. Dynamic change of the strain in materials could induce various types of deformations such as bending, rotating, or buckling. In the emerging 2-dimensional (2D) materials, the interface strain exhibits many new features and induces a lot of novel phenomena. In this talk, I will first present the fundamental study of elastic properties of several typical 2D materials, and then summarize the ways to introduce a strain at van der Waals interfaces in 2D materials. It is found that when the strain exists at the 2D material-substrate interface, the geometry of the 2D material can be engineered due to the naturally low interface energy. In such a strained system, dynamic web buckling of 2D semiconducting films is in situ observed with a delicately site-controlled initiation. The exploration of these systems not only provides mechanical insight to the understanding of functions and interface physics of layered hetero-structures, but also potentially allows engineering of layered materials as desired.

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