北京大学量子材料科学中心
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Seminar

Self-assembly of graphene ribbons on a substrate at the micrometer scale

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Abstract

We discuss the large-scale self-assembly of graphene ribbons we recently discovered for surface adhered sheets exfoliated onto silicon oxide substrates [1]. Directed folding of flap-like structures seeds growth of long ribbons that spontaneously peel and tear the sheet as they slide in superlubricous fashion. We observe ribbon growth up to 20 micrometers in size in ambient conditions. Measurement of ribbon velocity versus width in a slow growth regime reveals a logarithmic dependence consistent with thermally-activated bond dissociation. Our analysis suggests this form of self-assembly may be a general phenomenon common to a large class of 2D materials.

We present a theoretical treatment of the phenomena based an energy minimization analysis technique originally applied to macroscopic