Abstract Submitted
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Atomic-scale imaging and manipulation of ridges on epitaxial graphene on 6H-SiC(0001)[1] G.F. SUN, University of Wisconsin, Milwaukee, WI 53211, J.F. JIA, Q.K. XUE, Tsinghua University, Beijing 100084, P. R. China, L. LI, University of Wisconsin, Milwaukee, WI 53211 — The graphitization of hexagonal SiC surfaces provides a viable alternative for the synthesis of graphene on a wafer. Ridges are often observed on epitaxial graphene, particularly during the later stages of growth. These ridges (or "wrinkles") introduce ripples in the otherwise atomically flat graphene sheet, which likely causes scattering and reduces its carrier mobility. The origin of these features, however, is largely under debate. In this work, we show, by atomically resolved STM imaging, that ridges are in fact bulged regions of the graphene layer, as a result of bending and buckling to relieve the compressive strain between the graphene and SiC substrate [1]. We further demonstrate that their length, direction, and distribution can be manipulated and even new ones created by the pressure exerted by the STM tip. We have further determined a lower limit of terrace size for ridge formation to be ∼80 nm, and demonstrated the growth of nearly ridge-free graphene films on vicinal substrates.

[1] Sun et al., Nanotechnology **20,** 355701 (2009).

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