

In-situ atomic level observation of the strain response of graphene lattice

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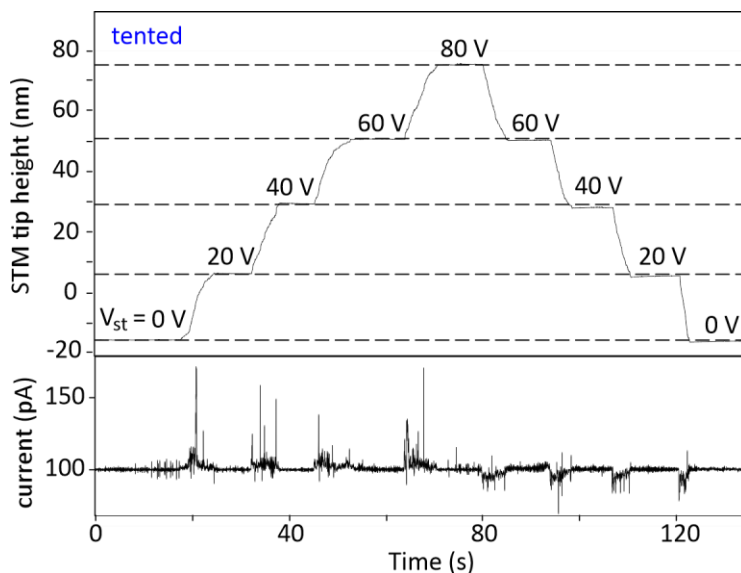


FIG. S1. Reversible graphene/polyimide height changes by increasing the voltage applied to the piezoelectric actuator carrying the indenter (V_{st}) in the tented condition. STM in a constant current mode (0.5 V, 100 pA).

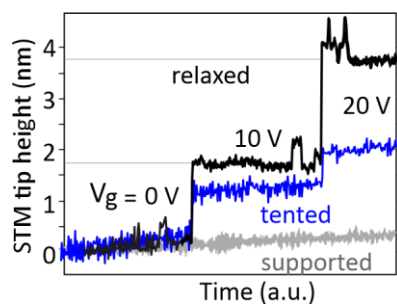


FIG. S2. Characterization of gate-controllability. STM-tip height feedbacks how the sample height is changed by increasing gate voltage (V_g).

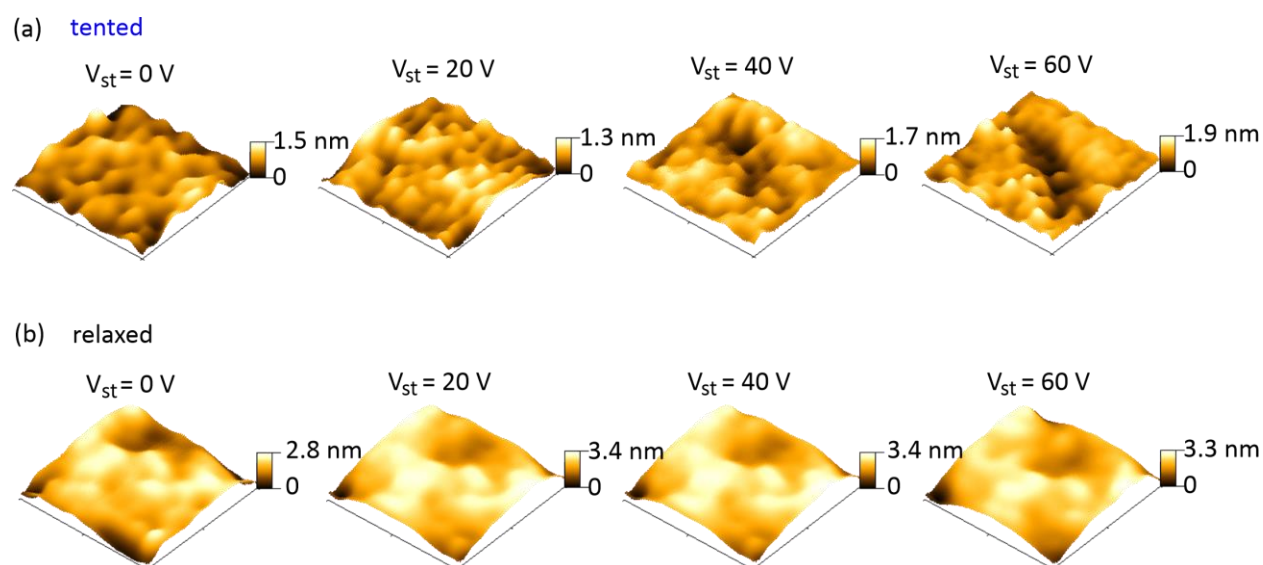


FIG. S3. The measured STM topography images with increasing indenter height (V_{st}). (a) tented and (b) relaxed cases. The size of images is 15 nm x 15 nm.

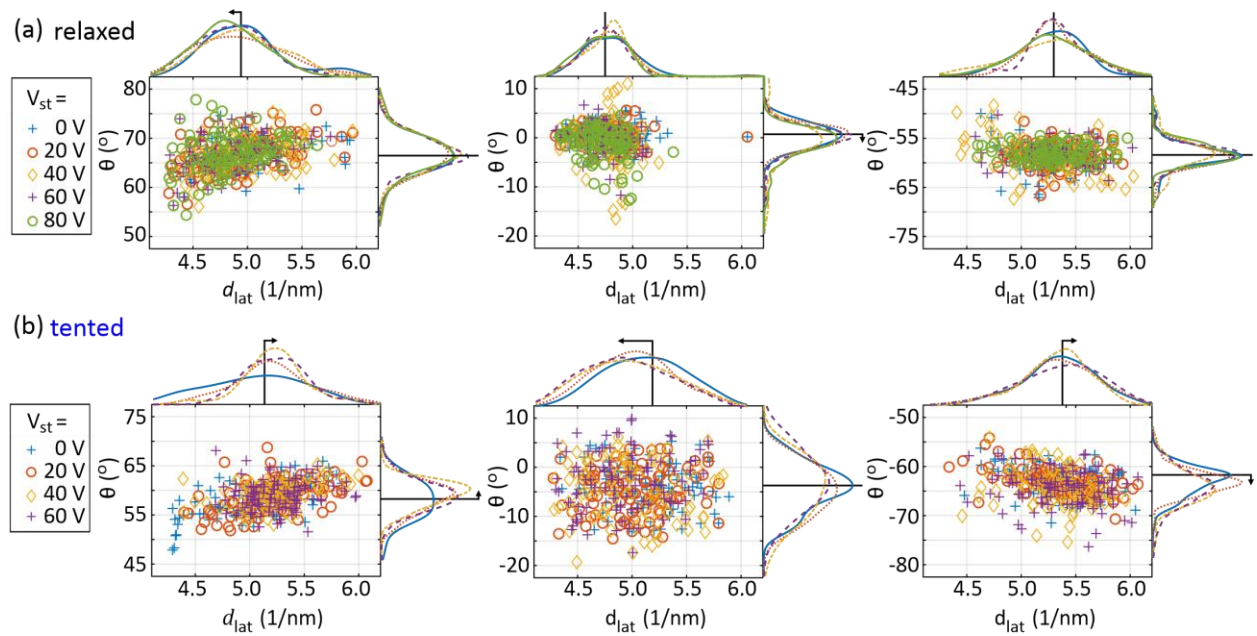


FIG. S4. The scatter plots with marginal kernel densities of local graphene lattice points in (a) relaxed and (b) tented case with increasing the piezoelectric actuator voltage (V_{st}). For each lattice point, d_{lat} is the length of reciprocal lattice vector, and θ is the angle defined by comparing with the horizon, 0° -line drawn in Fig. 8(c).

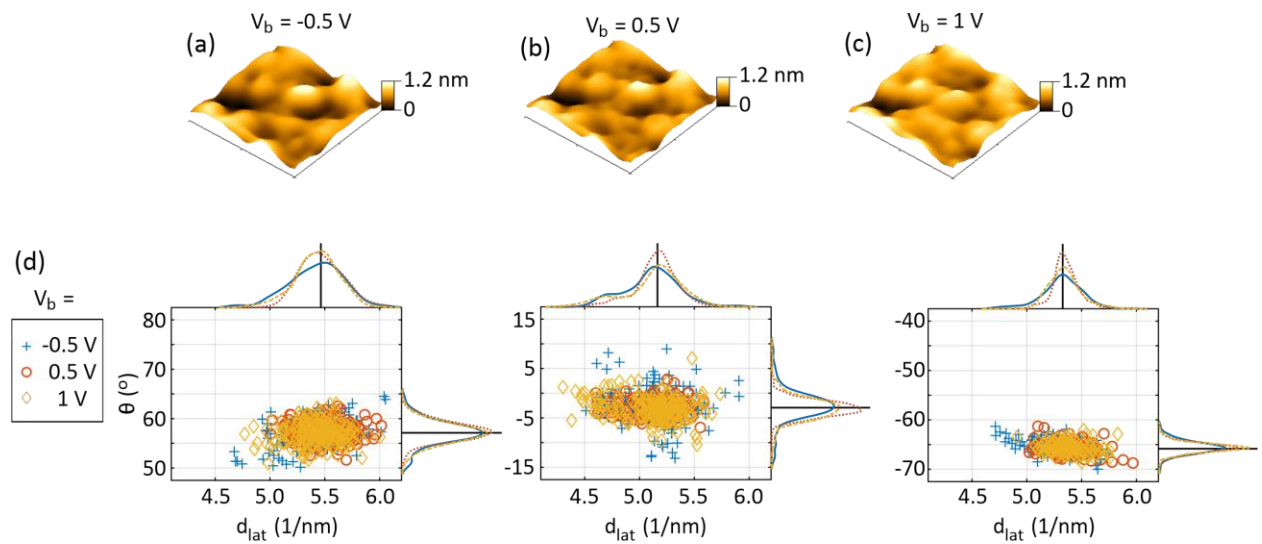


FIG. S5. (a-c) STM topography images measured at the same area in the tented case with different bias voltages (V_b). (d) The scatter plots with marginal kernel densities of local graphene lattice points analyzed from (a-c). The size of images is 15 nm x 15 nm.