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Supplementary Materials

Pinning and Anharmonic Phonon Effect of Quasi-Free-Standing Bilayer Epitaxial Graphene on SiC

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The directly obtained spectra of the epitaxial graphene was shown in Fig. S1b. G peak was not obvious due to the effect of second-order peak of SiC substrate. The detailed information about G peak should be obtained by subtracting the simultaneously SiC spectra at the same temperature. After the substrate subtraction in Fig. S1c, the influence of second-order SiC peaks were avoided and the G peak become obvious. The Fig. S1c owns the same Y scale with that of Fig. S1a and Fig. S1b. Usually, the spectrum will be enlarged in the magnification as shown in Fig. S1d for the convenience of observation.

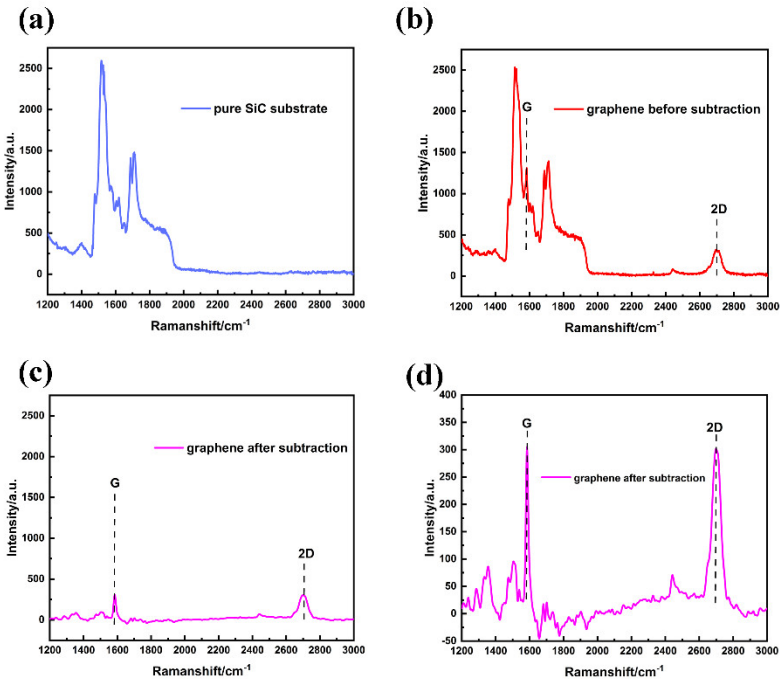

Figure S1. Raman spectra of pure SiC substrate (**a**), graphene before (**b**) and after (**c**), (**d**) subtraction.