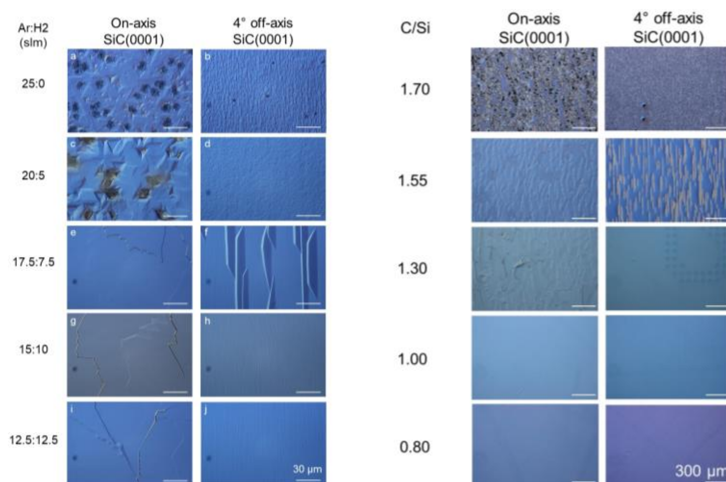
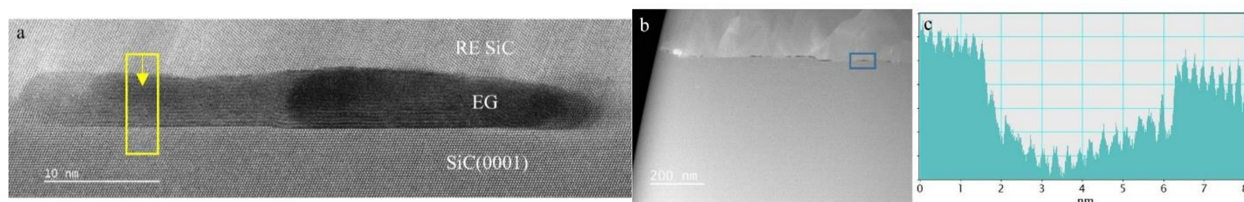
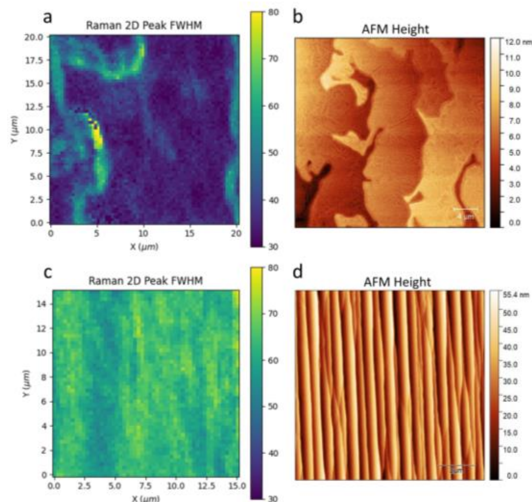
Supplemental Information



Nomarski micrographs for RE SiC films on epitaxial graphene (EG) substrates using various Ar:H_2 carrier gas ratios and a fixed C/Si ratio of 1.55 (left) and various C/Si ratios with a fixed Ar:H2 ratio of 17.5:7.5 slm (right). Highest quality films are found with C/Si < 1.55 and Ar:H2< 20:5.



Cross-sectional HAADF-STEM of the SiC/EG/SiC(0001) interface. A close up of a multilayer segment of EG (a) shows multiple layers of graphene present in a small region. Lower magnification STEM (b) shows several multilayer EG regions at the interface. (c) An intensity profile taken from the yellow box in (a) shows the interplanar spacing of the multilayer graphene to be $d(0001)_G$ = 3.32Å, close to graphite's interplanar spacing (3.35Å)



Raman EG 2D peak FWHM maps (a, c) and AFM height images (b, d) of representative samples of ~1ML EG grown on nominally on-axis, semi-insulating 6H-SiC(0001) (a, b) and ~4-5ML EG on 4°-offcut, N-type 4H-SiC(0001) (c, d). FWHM color scale is measured in cm^{-1}.

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