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Amorphous carbon for structured step bunching during graphene growth on SiC JAMES PALMER, JAN KUNC, YIKE HU, JOHN HANKINSON, ZELEI GUO, Georgia Institute of Technology, Atlanta Georgia, CLAIRE BERGER, Georgia Institute of Technology, Atlanta Georgia, CNRS - Institut Néel, Grenoble, France, WALT DE HEER, Georgia Institute of Technology, Atlanta Georgia — Structured growth of high quality graphene is necessary for technological development of carbon based materials. Specifically, control of the bunching and placement of surface steps under epitaxial graphene on SiC is an important consideration for graphene device production. We demonstrate lithographically patterned evaporated amorphous carbon as a method to pin SiC surface steps. Evaporated amorphous carbon is an ideal step-flow barrier on SiC due to its chemical compatibility with graphene growth and its structural stability at high temperatures, as well as its patternability. The amorphous carbon is deposited in vacuum on SiC prior to graphene growth. In the graphene furnace at temperatures above 1200°C, mobile SiC steps accumulate at these amorphous carbon barriers, forming an aligned step free region for graphene growth at temperatures above 1330°C. AFM imaging and Raman spectroscopy support the formation of quality step-free graphene sheets grown on SiC with the step morphology aligned to the carbon grid.

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