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Selective Growth of Graphene by Pulsed Laser Annealing Ion Implanted SiC KARA BERKE, XIAOTIE WANG, NICK RUDAWSKI, University of Florida, DINESH VENKATACHALAM, Australian National University, JOEL FRIDMANN[1], BRENT GILA, University of Florida, FAN REN, University of Florida, Dept. of Chemical Engineering, ROB ELLIMAN, Australian National University, ARTHUR HEBARD, BILL APPLETON, University of Florida — We report a method for site-selective graphene growth on SiC for direct nano-scale patterning of graphene. Crystalline SiC was implanted with Si and C ions to amorphize the sample surface, then subjected to pulsed laser annealing (PLA); graphene growth occurred only where ions were implanted. PLA parameters including the fluence, number of pulses, and annealing environment were investigated to optimize the growth process. Our previous work involving Au, Cu, and Ge implants in SiC suggested that both the implanted species and surface amorphization affect graphene growth. In this work, we show that surface amorphization alone, without the presence of foreign ionic species, can be used with PLA to create site-selective graphene growth on SiC. Samples were characterized using Raman spectroscopy and cross-sectional transmission electron microscopy.

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