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Epitaxial Graphene Formation on SiC(000$\bar{1}$)[1] NISHTHA SRIVASTAVA, LUXMI LUXMI, PATRICK FISHER, RANDALL FEENSTRA, Carnegie Mellon University, JAKUB KEDZIERSKI, MIT Lincoln Laboratory, YUGANG SUN, Argonne National Laboratory, GONG GU, Sarnoff Corporation — The formation of epitaxial graphene on SiC(000$\bar{1}$) (the *C-face*) is studied using atomic force microscopy, spatially resolved Auger electron spectroscopy, low energy electron diffraction, Raman spectroscopy, and electrical measurements. Starting from hydrogen-etched surfaces, graphene formation by vacuum annealing is observed over the temperature range 1200-1400 $^\circ$C. Unlike the situation for the Si-face, it is found for the C-face that the initial graphene formation is three-dimensional. Micron-size islands with height of several nm are formed, with the graphene being thinner on these islands than between the islands. At higher formation temperatures the graphene layer becomes relatively flat, and has typical thickness of >10 monolayers. Electron diffraction indicates rotational disorder, with $\pm 15^\circ$-oriented spots observed in addition to the known $\pm 2.2^\circ$-spots.[2] Field-effect mobilities as high as 4400 cm^2/Vs for multi-layer graphene films are found, with relatively good homogeneity over the wafer. [2]J. Hass et al., Phys. Rev. Lett. 100, 125504 (2008).

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Randall Feenstra
Carnegie Mellon University

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