

Abstract Submitted
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SPALED Studies of the Growth of Zero to Mono-layer Graphene on SiC(0001)¹ M. HUPALO, Ames Laboratory, M. T. HERSHBERGER, Iowa State University and Ames Laboratory, H. HATTAB, Ames Laboratory, D. C. MCDOUGALL, Iowa State University and Ames Laboratory, M. HORN VON HOEGEN, University of Duisburg-Essen, M. C. TRINGIDES, Iowa State University and Ames Laboratory — The growth of graphene on SiC was studied in detail with SPA LEED to understand the transition from zero to monolayer graphene with increasing temperature starting at 1200C. Both the changing diffraction spots with annealing and their line shapes are studied in detail until a fully completed monolayer is obtained with only 6x6 spots remaining. In particular we focus on two strong features not investigated previously: (i) superstructures spots at $n/13$ locations present between the specular and the graphene spots. These spots are possibly related to different coincidence lattices before graphene locks into its final 6x6 orientation. (ii) The presence of a very broad background intensity covering $\sim 60\%$ of the BZ both around the specular and graphene spots whose origin is still unknown. Detailed studies of the dependence of this background component on energy and comparison between the graphene and specular spots suggest that the origin is not due to the standard variation with electron energy, i.e. a $g(s)$ curve caused by the topography. Throughout the literature this broad background has been seen in graphene grown in different types of substrates. We comment on possible reasons for the origin of the background.

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