

Abstract Submitted
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Evolution of graphene islands growing on Cu foils¹ JOSEPH WOFFORD, University of California at Berkeley and Lawrence Berkeley National Laboratory, SHU NIE, NORMAN BARTELT, KEVIN MCCARTY, Sandia National Laboratories, OSCAR DUBON, University of California at Berkeley and Lawrence Berkeley National Laboratory — Using low-energy electron microscopy we investigate, in real time, the growth of graphene monolayers on Cu foils. Graphene islands evolve from an initially compact form into an increasingly ramified, four-lobed shape, reflecting the symmetry of the (100)-textured Cu surface. Diffraction analysis reveals that each lobe is an individual graphene domain, differentiated by a rotation about the film normal, making the islands polycrystalline. An inspection of the morphological evolution of the graphene lobes shows the growth fronts possess an angularly dependent velocity, which is consistent with a growth mode dominated by edge kinetics. The fast growth direction of each lobe tends to align with the $\langle 001 \rangle$ in-plane directions of the Cu surface but not with a high symmetry direction of the graphene lattice. Finally, the implications of this unexpected growth mechanism on the formation of high-quality graphene films on Cu foils are evaluated.

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