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Direct Chemical Vapor Deposition of Single and Few–Graphene Layers on Dielectric Surfaces ARIEL ISMACH, Electrical Engineering and Computer Science Department, University of California at Berkeley, CLARA DRUZGALSKI, SAMUEL PENWELL, The Molecular Foundry, Lawrence Berkeley National Laboratory, MAXWELL ZHENG, ALI JAVEY, JEFFREY BOKOR, Electrical Engineering and Computer Science Department, University of California at Berkeley,, YUEGANG ZHANG, The Molecular Foundry, Lawrence Berkeley National Laboratory — Direct deposition of graphene on various dielectric substrates is demonstrated using a single-step chemical vapor deposition process. Single and few-layer graphene is formed through surface catalytic decomposition of hydrocarbon precursors on thin copper films pre-deposited on dielectric substrates. The copper films de-wet and evaporate during or immediately after graphene growth, resulting in graphene deposition directly on the bare dielectric substrates. Scanning Raman mapping and spectroscopy, scanning electron microscopy, and atomic force microscopy confirm the presence of continuous graphene layers on tens of micron square metal-free areas. The revealed growth mechanism opens new opportunities for deposition of higher quality graphene films on dielectric materials.

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