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Low-Energy Electron Microscopy Characterization of Graphene on Ruthenium and Intercalated Cobalt SAMUEL BRANTLY, Lawrence Berkeley National Laboratory, SAMUEL CIOCYS, KAYLA CURRIER, University of California Berkeley, ANDREAS SCHMID, ALESSANDRA LANZARA, Lawrence Berkeley National Laboratory — Since 2004, when graphene was first successfully exfoliated and made free stranding, there has been interest in characterizing the nature of substrate interactions with regards to the overlying graphene lattice. H. Hibino et al. (2008), demonstrated that such an interaction can be probed via the detection of intensity oscillations in the Low-Energy Electron Reflectivity (LEER) spectrum. Further work by R. Feenstra et al. (2013) pinned the origins of such reflectivity minima to the formation of interlayer electron states. Yet, with the growth of different methods of graphene nucleation and the recent discovery of a strong Dzyaloshinskii-Moriya interaction between graphene and intercalated cobalt monolayers by H. Yang et al. (2018), there has been renewed interest in these interlayer states. In this experiment we demonstrate a shift in the intensity of backscattered low-energy electrons via Low-Energy Electron Microscopy across spatially resolved regions of graphene grown via separate methods on ruthenium, then subjected to cobalt intercalation. The graphene was formed by both segregation from bulk and by chemical vapor deposition (CVD) of ethylene. In both cases we demonstrate that as cobalt is intercalated beneath the graphene and substrate the interlayer state is quenched.

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