Abstract Submitted
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Influence of subsurface hydrogen on the properties of single layer graphene grown on Ru(0001)[1] BOGDAN DIACONESCU, Los Alamos National Laboratory, FRANK HAGELBERG, East Tennessee State University, MAXWELL GRADY, KARSTEN POHL, University of New Hampshire — Graphene has aroused tremendous interest due to its remarkable electronic and mechanical properties. The lack of a band-gap, however, causes a serious challenge for implementing graphene as a material for electrical switches and therefore creative ways of inducing this band-gap are needed. We will present a STM/LEED/DFT study of the single layer graphene on Ru(0001) system in the presence of hydrogen. Structural studies show arrays of Moire superlattices with sizes ranging from 0.9 to 3.0 nm in the presence of hydrogen on the compact surface of ruthenium. First principle calculations help explain the appearance of these arrays of graphene reconstructions driven by the H presence at the Ru(0001) interface, and furthermore, predict the appearance of a bandgap with values correlated with the Moire superstructure sizes in the presence of hydrogen.

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Bogdan Diaconescu
Los Alamos National Laboratory

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