Abstract Submitted
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Growth and analysis of polymorphic graphene with STM and LEEM-IV for applications in molecular self-assembly and organic electronics[1] MAXWELL GRADY, Univ of New Hampshire, TAISUKE OHTA, BOGDAN DIACONESCU, Sandia National Laboratory, ZHONGWEI DAI, KARSTEN POHL, Univ of New Hampshire — Graphene has aroused tremendous interest due to its remarkable electronic and mechanical properties, and is of interest for use in organic electronic devices such as organic photovoltaic cells. We present an analysis of a novel graphene system grown on Ru(0001) in the presence of atomic hydrogen and carbon vapor using STM and LEEM-IV. Structural studies completed with STM show a wide array of moire superlattice sizes ranging from 0.9 to 3.0 nm. Preliminary LEEM and LEEM-IV results confirm the presence of ordered graphene atop the Ru(0001) surface. Investigation using LEEM-IV provides information about the carbon layer thickness; also, micro-LEED-IV determines the precise atomic reconstruction of the interface region. In this regard, we believe the hydrogen present in the system to be interstitial at the carbon-ruthenium interface thus passivating the ruthenium surface, decoupling, and lifting the carbon layer from the substrate. The structural polymorphism displayed by this system is of interest for the study of directed self-assembly. Control over moire size can aid in future work using graphene as a template for self-assembled growth of organic electronics.

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