Abstract Submitted
for the SES16 Meeting of
The American Physical Society

Temperature Evolation Of Quasi-One Demensional C_{60} Nanostructures On Rippled Graphene[1] CHUANHUI CHEN, HUSONG ZHENG, ADAM MILLS, RANDY HEFLIN, CHENGGANG TAO, Virginia Tech — As two nanostructured allotropes of carbon, both graphene and fullerene exhibit fascinating physical properties and have numerous applications. A particularly interesting arrangement of C_{60} is the quasi-one dimensional (1D) structures that are excellent model systems and prototypes of 1D quantum confinement of electronic states. However, quasi-1D C_{60} nanostructures have been rarely realized experimentally due to their highly anisotropic configuration.Here we experimentally realized quasi-1D C_{60} nanostructures on rippled graphene by utilizing the linear periodic potential in graphene as a template. Through careful control of the subtle balance between the linear periodic potential of rippled graphene and the C_{60} surface mobility, we demonstrated that C_{60} molecules can be arranged into a novel 1D C_{60} chain structure with widths of two to three molecules. At a higher annealing temperature, the 1D chain structure transitions to a more compact hexagonal close packed quasi-1D stripe structure. This first experimental realization of 1D C_{60} structures on rippled graphene paves a way for fabricating new C_{60}/graphene hybrid structures for future applications in electronics, spintronics and quantum information.

[1]This work is supported by the U.S. Army Research Office under the grant W911NF-15-1-0414

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Date submitted: 18 Oct 2016 Electronic form version 1.4