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STM STUDY OF QUASI-1D C_{60} NANOSTRUCTURES ON RIPPLED GRAPHENE[1] CHUANHUI CHEN, HUSONG ZHENG, ADAM MILLS, JAMES 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) structure, an excellent model system and prototype of quantum confinement of electronic states. However, quasi-1D C_{60} nanostructures have been rarely realized experimentally due to their highly anisotropic configuration. I will report our experimental realization of quasi-1D C_{60} nanostructures on rippled graphene by utilizing the linear periodic potential in grapheme. Through careful control of the subtle balance between the linear periodic potential of rippled graphene and the C_{60} intermolecular interaction, 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 may pave a way for fabricating new C_{60}/graphene hybrid structures for future applications in electronics, spintronics and quantum information.

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