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Nanoscale topographical replication of graphene architecture by manufactured DNA nanostructures YOUNGKWON MOON, Department of Physics, Sungkyunkwan University, JIHOON SHIN, Sungkyunkwan Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University, SOONBEOM SEO, Department of Physics, Sungkyunkwan University, SUNG HA PARK, Department of Physics, Sungkyunkwan Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University, JOUNG REAL AHN, Department of Physics, Sungkyunkwan University — Despite many studies on how geometry can be used to control the electronic properties of graphene, certain limitations to fabrication of designed graphene nanostructures exist. Here, we demonstrate controlled topographical replication of graphene by artificial deoxyribonucleic acid (DNA) nanostructures. Owing to the high degree of geometrical freedom of DNA nanostructures, we controlled the nanoscale topography of graphene. The topography of graphene replicated from DNA nanostructures showed enhanced thermal stability and revealed an interesting negative temperature coefficient of sheet resistivity when underlying DNA nanostructures were denatured at high temperatures.

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