

Abstract Submitted
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Application of Scanning Probe Nanolithography to fabrication and study of large area graphene and Transition Metal Dichalcogenides heterostructures¹ RUI DONG, LOGAN MOORE, IRMA KULJANSIHVILI, Saint Louis University — Two-dimensional atomic crystals, such as graphene and layered transition metal dichalcogenides (TMDCs), have drawn significant attention because of the unique physical and chemical properties. Recently developed graphene/TMDCs stacking structures provide an attracting solution to design and fabricate unique electronic devices and nanostructures. In this study, we employ the “direct write” patterning technique, to fabricate Graphene/TMDCs heterostructures. TMDCs precursor is utilized as an “ink” to create the arrays of patterns employing multi-pen AFM cantilevers. The patterned structures of TMDCs precursor on graphene /silicon oxide/silicon in processed in CVD to produce Graphene/TMDCs heterostructures. Raman spectroscopy and AFM characterization demonstrates high quality of as-prepared Graphene/TMDCs nanostructures. Mask free approach significantly reduces contamination of the graphene surface during patterning and demonstrates a promising unconventional technology for fabricating high quality Graphene/TMDCs or other layered nanostructures in a convenient and economical manner with the nanoscale precision.

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