

Abstract Submitted  
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**Direct Printing of Graphene onto Plastic Substrates.** DANIEL HINES, Laboratory for Physical Sciences, EVGENIYA LOCK, SCOTT WALTON, MIRA BARAKET, MATTHEW LASKOSKI, SHAWN MULVANEY, PAUL SHEEHAN, WOO LEE, JEREMY ROBINSON, Naval Research Laboratory — Graphene films have been synthesized on metal foils using CVD growth and have the potential to be compatible with roll-to-roll printing. To be usable in electronic devices, these films need to be removed from the metallic substrate. Currently this is accomplished by spin coating a polymer film over the graphene and chemically etching away the metal substrate. We have developed a direct printing method that allows graphene films to be printed off the metal substrate onto a polymer substrate. This printing process does not generate chemical waste, is compatible with roll-to-roll processing and renders the metal foil reusable. Adhesion of the graphene film to the polymer substrate is established by attaching perfluorophenylazides (PFPA) azide linker molecules to a plasma activated polymer surface. The transfer printing was performed by placing the PFPA treated polymer surface in contact with a graphene covered Cu foil and heating under pressure. Graphene films successfully printed onto a polystyrene substrate have been characterized by Raman spectroscopy and electrical measurements revealed the presence of Gr on the polymer surface. Details of the printing process along with characteristics of the graphene film after printing will be presented.

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