

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Transfer-free fabrication methods for graphene based devices**  
MARK LEVENDORF, CARLOS RUIZ-VARGAS, SHIVANK GARG, JIWOONG PARK, Cornell University — Integration of graphene into modern electromechanical systems necessitates processes that are both clean and fully automatable. Currently, methods for fabricating graphene based devices typically require a manual liquid transfer process that can easily damage the sheet. We discuss two transfer-free device fabrication techniques that are directly applicable to nanoscale electronics as well as NEMS resonators. Graphene is grown directly onto the final device substrate by using evaporated copper as a catalyst. The graphene is then patterned into the desired shape and the copper is removed by either a liquid or completely dry etch process. By using these techniques we are able to produce both ultra long graphene channels ( $>0.3$  mm) as well as suspended graphene devices. Resulting arrays of graphene FETs are produced in high yield ( $>95\%$ ) and exhibit uniform electrical properties including current saturation and moderate mobility.

Mark Levendorf  
Cornell University

Date submitted: 19 Nov 2009

Electronic form version 1.4