

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Transfer-free fabrication methods for graphene based devices
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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 de-
vice 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.

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Date submitted: 19 Nov 2009

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