

Abstract Submitted
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Low-Damage Sputter Deposition on Graphene CHING-TZU CHEN,
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son Research Center, Politecnico di Torino, MARCIN GAJEK, SIMONE RAOUX,
IBM Thomas J Watson Research Center — Despite its versatility and prevalence in
the microelectronics industry, sputter deposition has seen very limited applications
for graphene-based electronics. We have systematically investigated the sputter-
ing induced graphene defects and identified the reflected high-energy neutrals of
the sputtering gas as the primary cause of damage. In this talk, we introduce a
novel sputtering technique that is shown to dramatically reduce bombardment of
the fast neutrals and improve the structural integrity of the underlying graphene
layer. We also demonstrate that sputter deposition and in-situ oxidation of 1 nm
Al film at elevated temperatures yields homogeneous, fully covered oxide films with
r.m.s. roughness much less than 1 monolayer, which shows the potential of using
such technique for gate oxides, tunnel barriers, and multilayer fabrication in a wide
range of graphene devices.

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