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Transfer-Free, Wafer-Scale, and Patterned Synthesis of Graphene on Dielectric Substrates HOSSEIN SOJOUDI, SAMUEL GRAHAM, Woodruff School of Mechanical Engineering, Georgia Institute of Technology, 771 Ferst Dr Atlanta, GA 30332-0405 — We report a method for the direct, wafer-scale synthesis of graphene on dielectric substrates using a solid carbon source. Graphene films were synthesized through the thermal decomposition of poly(methyl methacrylate) on copper coated quartz and Si/SiO₂ substrates in a low pressure H₂/Ar environment. The Cu film partially evaporated during growth, leaving a graphene layer directly on the dielectric substrate. Polyacrylamide was used for synthesis of N-doped graphene due to its nitrogen content. A similar method with process optimization was utilized to grow graphene without any external carbon source. Trace amounts of carbon in metal films result in direct formation of graphene on insulators through a segregation process. A wet etch step allowed complete removal of the metal film, leading to continuous graphene coverage of the surface. This technique utilized for patterned synthesis of graphene and can be used in Si-wafer compatible device fabrication.

Prefer Oral Session
 Prefer Poster Session

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