

Abstract Submitted
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Van der Waals MBE growth of graphene on dielectric substrates¹

SHENG WANG, ULRICH WURSTBAUER, Columbia University, NY, JORGE M. GARCIA, Instituto de Microelectrónica de Madrid. CNM. CSIC. Spain, LARA FERNANDES DOS SANTOS, LEI WANG, ANTONIO LEVY, JUNGSIK PARK, CORY R. DEAN, Columbia University, NY, LOREN N. PFEIFFER, Princeton University, NJ, JAMES HONE, ARON PINCZUK, Columbia University, NY — Graphene growth on dielectric substrates has potential to enable new kinds of devices and applications. We explore graphene growth by direct deposition of carbon on different dielectric substrates in a MBE environment. Here we consider h-BN and sapphire substrates. The quality of fabricated graphene layers depends on growth conditions such as carbon deposition rate, substrate temperature and total amount of deposited carbon. Characterizations by spatially resolved Raman spectra and AFM images suggest the formation of high quality graphene. On h-BN substrates, single layer growth occurs as nano-domains. On sapphire, large area growth happens with monolayer thickness fluctuations. These results are consistent with a van der Waals growth mode of graphene on dielectric substrates.

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