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A new route to large area graphene by selective pulsed laser ablation A. ROY BARMAN, S. DHAR, G. NI, X. WANG, X. XU, Z. YI, A ARIANDO, B. OEZYILMAZ, T. VENKATESAN, NanoCore, National University of Singapore, Singapore 117576, S. TRIPATHY, IMRE, Singapore 117602, NANOCORE, NATIONAL UNIVERSITY OF SINGAPORE, SINGAPORE 117576 TEAM, IMRE, SINGAPORE 117602 COLLABORATION — Because of its remarkable electronic properties graphene has a very bright technological future. One of the current challenges is the fabrication of defect free graphene over large areas, a must for device technology. We present a new route for producing a uniform, large area single layer graphene by selectively ablating multilayer graphene by pulsed laser irradiation. An energy density window is found within which all the layers except a single layer graphene are successfully ablated at room temperature either in Ar atmosphere or vacuum. The residual defects after laser ablation observed by Raman spectroscopy has little influence on the intrinsic electron mobility. These defects are removed by a post ablation high temperature annealing. In a bottoms-up approach, this process is being coupled with a CVD graphene deposition system which can potentially produce high purity single layer graphene on a large scale.

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