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Creating Vacancies in Supported and Suspended Graphene Field Effect Transistors SHUREN HU, A.K.M. NEWAZ, ANTHONY HMELO, KIRILL BOLOTIN, Vanderbilt University — We have studied the creation of vacancy defects in both graphene samples supported on SiO₂ substrate and suspended graphene devices. The defects were created by irradiating graphene with a 30KeV Ga⁺ ion beam in UHV; the effect of these defects on electrical transport in graphene was measured *in situ*. We find that the number of defects created in supported devices is dramatically higher in comparison with suspended devices. Using Monte-Carlo and SRIM simulations, we identify the formation of defects by secondary ions in the case of supported devices as a likely explanation of these results. We have also observed that the transport quality degrades drastically with respect to vacancy defect density and follows the same general trend for both supported and suspended graphene. These results may be important in designing devices for high radiation working environments, such as space electronics.

Prefer Oral Session
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