

Abstract Submitted
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Conductance Anisotropy in Epitaxial Graphene Sheets Generated by Substrate Interactions ARNALDO LARACUENTE, Naval Research Laboratory, MICHAEL YAKES, DANIEL GUNLYCKE, JOSEPH TEDESCO, PAUL CAMPBELL, D. KURT GASKILL, PAUL SHEEHAN — A Four-Probe UHV STM was used to examine graphene grown epitaxially on SiC. By placing all four probes on a terrace or across multiple terraces, we show that current flows more readily along the terraces than across them. The cause of this anisotropy is the interaction between the graphene and morphology of the substrate. We propose a model where charge buildup at the step edges lead to local scattering of charge carriers. This result highlights the importance of creating large uniform terraces in epitaxially grown graphene on SiC for future use in device applications. More generally, it suggests that no matter what method is used to generate the graphene a careful consideration of the underlying substrate will be required to achieve optimal performance.

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