Abstract Submitted
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Anomalous noise characteristics in graphene p-n junctions[1] JANICE WYNN GUIKEMA, ATIKUR RAHMAN, NINA MARKOVIC, Johns Hopkins University — Graphene p-n junctions provide an interesting platform to study the Dirac nature of charge carriers, which gives rise to phenomena such as Klein tunneling and electron lensing. p-n junctions also play an important role in graphene nanodevices, but the ubiquitous low-frequency noise typically limits the device performance. It has been observed that the low-frequency noise for back-gated single layer and bilayer graphene decreases at the Dirac point, even though the resistance is maximal there. This decrease has been attributed to the effects of spatial charge inhomogeneity, and the noise in such devices decreases with decreasing temperature. We will present noise characteristics of dual-gated graphene p-n junction devices. At the Dirac point, the noise shows an "M" shape as a function of top gate voltage. Away from the Dirac point the shape changes depending on the back gate and top gate voltage. Unlike the low-frequency noise in graphene nanodevices, noise across the p-n junction decreases with increasing temperature. We also observed that the noise amplitude is larger in p-n-p or n-p-n devices than in p-p-p or n-n-n devices. We will discuss the mechanism that explains this anomalous noise behavior in graphene p-n junction.

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