Abstract Submitted
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Quantum transport and Klein tunneling in graphene heterojunctions ANDREA YOUNG, PHILIP KIM, Physics Department, Columbia University — I will discuss the observation of quantum conductance oscillations in extremely narrow graphene heterostructures where a resonant cavity is formed between two electrostatically created bipolar junctions. From analysis of the observed interference pattern, it can be inferred that individual p-n junctions have a collimating effect on transmitted carriers, leading directly to the observation of resonant oscillations despite the largely diffusive carrier dynamics. The oscillatory part of the conductance is insensitive to scattering within individual p-n junctions, electrons which scatter in the junctions, making them a novel probe of the ballistic physics of graphene at the Dirac point and allowing an estimate of the electric field due to nonlinear screening. In a weak applied magnetic field, the oscillations undergo a phase shift characteristic of reflectionless normal transmission, or "Klein Tunneling," at the individual p-n junctions. Finally, at high magnetic field, graphene heterostructures show modified Shubnikov de Haas oscillations due to the inhomogenous external potential.

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