Abstract Submitted for the MAR09 Meeting of The American Physical Society

The Image Potential for Graphene with an electrostatic Grating<sup>1</sup> GODFREY GUMBS, Hunter College/CUNY, DANHONG HUANG, USAF Research Lab, PEDRO ECHENIQUE, DIPC, Donastia, San Sebastian — We calculate the surface response function and the image potential of a layered structure of twodimensional (2D) electron systems (ES). A point charge is placed at a distance away from the surface which is in the xy-plane. These 2D layers are coupled through the Coulomb interaction and there is no interlayer electron hopping. The separation between adjacent layers can be adjusted to investigate the role which layer separation and the number of layers play on both the surface response function and the image potential. Specifically, we consider the system composed of graphene layers or the layered 2D electron gas (EG) formed at the interface of a semiconductor heterostructure such as GaAs/AlGaAs. We show that the image potential for graphene is qualitatively the same as for the 2DEG. We examine the way in which the image potential is modified by applying a one-dimensional periodic electrostatic potential (through a gated grating for modulation). These results indicate that the charge screening for graphene is not much different from the 2DEG.

<sup>1</sup>Supported by contract FA 9453-07-C-0207 of AFRL.

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Date submitted: 20 Nov 2008

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