## Coulomb Drag in Double Layer Graphene Systems

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Coulomb drag effect in semiconductor electron-electron and electron-hole double layer systems has been a useful tool to study the many-body properties of such systems. In these systems, current is allowed to flow in one of the layers and the potential difference in the other layer is measured. Their ratio which is related to the transresistivity or the drag resistivity is a measure of the momentum transfer from one-layer to the other.[1] Recently, experimental results on the drag resistivity of two parallel layers of graphene sheets have been reported.[2] In this work, we use the Kubo formalism and the mode-decoupling approximation to express the drag resistivity in terms of the intra- and inter-layer density-density response functions of a double layer graphene system to compare our results with those found in the experiment and other theoretical works. We also explore the drag effect in the electron-hole graphene layers and the possibility of excitonic condensation in these systems.[3]

[1]See, e.g. K. Das Gupta et al., Adv. Cond. Matt. Phys. article ID 727958 (2011).
[2]S. Kim et al. cond-mat/arXive 1010.2113
[3]H. Min, R. Bistritzer, J.-J. Su, A. H. MacDonald, Phys. Rev. B 78, 121401 (2008)