

Abstract Submitted  
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**Multi-Domain Model of Bilayer Graphene with Broken Time Reversal Symmetry**<sup>1</sup> GILAD BEN-SHACH, AMIR YACOBY, BERTRAND I. HALPERIN, Harvard University — Recent experiments suggest strange new states for bilayer graphene at zero electric and magnetic fields [1]. We consider recent models for the ground state of bilayer graphene with interactions [2,3]. These models predict domains with non-zero local Hall conductance but an expected overall average Hall conductance of  $\sigma_{xy} = 0$ , and should exhibit broken time reversal symmetry. We examine theoretical models for random four-probe measurements for various domain geometries in bilayer graphene at zero electric and magnetic fields. We find non-zero Hall conductance of magnitude dependent on domain geometry and network structure.

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[2] Nandkishore, R., Levitov, LPhys. Rev. Lett. **104**, 156803 (2010)

[3] Zhang F., Jung J., Fiete, G.A., Niu, Q., MacDonald, A.H. arXiv:1010.4003v1 (2010)

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