

Abstract Submitted
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Spontaneous broken time reversal symmetry and persistent current states in bilayer graphene JEIL JUNG, Department of Physics, University of Texas at Austin, USA, MARCO POLINI, NEST, Istituto Nanoscienze-CNR and Scuola Normale Superiore, I-56126 Pisa, Italy, ALLAN MACDONALD, Department of Physics, University of Texas at Austin, USA — We report on the possibility of electron interaction driven spontaneously broken time reversal symmetry states in bilayer graphene through Fermi surface instability (aka Pomeranchuk instability) in both $\ell = 0$ and $\ell = 1$ channels. The conditions for spontaneous current carrying equilibrium states are most favorable in the regime of high interlayer potential difference and finite doping. These states are accompanied by valley polarization, which leads to a finite Hall conductivity that is approximately proportional to carrier density. Ref. cond-mat arXiv:1111.1765

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