Abstract Submitted
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Many-body instability of Coulomb interacting bilayer graphene: RG approach[1] OSKAR VAFEK, KUM YANG, NHMFL and Florida State U. — Low-energy electronic structure of (unbiased and undoped) bilayer graphene consists of two Fermi points with *quadratic* dispersions if trigonal-warping is ignored. We show that a short-range (or screened Coulomb) interactions are marginally *relevant* and use renormalization group to study their effects on low-energy properties of the system. We find that the two quadratic Fermi points spontaneously split into four Dirac points. This results in a nematic state that spontaneously breaks the six-fold lattice rotation symmetry (combined with layer permutation) down to a two-fold one, with a finite transition temperature. Critical properties of the transition and effects of trigonal warping are also discussed.

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