Abstract Submitted
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Spin-skyrmion in graphene WENCHEN LUO, RENÉ CÔTÉ, University of Sherbrooke — In the presence of a magnetic field, the band structure of the two-dimensional electron gas in graphene consists in a series of Landau levels with energy $E_n = \pm\sqrt{2}v_F\sqrt{|n|}/\ell$. Each Landau level is 4-fold degenerate including valley and spin degrees of freedom. Working in the Hartree-Fock approximation and a finite Zeeman coupling, we compute the energy required to excite a spin-skyrmion (or antiskyrmion) in Landau levels $n = 1, 2$ at filling factors $\nu = 4, 8$. We show that a skyrmion-antiskyrmion pair has lower energy than an electron-hole pair at these two filling factors. We compare our results with a field-theoretical calculation [1] and with a recent experimental measurement of the transport activation gap in this system.

[1] Kun Yang, S. Das Sarma and A. H. MacDonald, Phys. Rev. B **74**, 075423 (2006).

Wenchen Luo
University of Sherbrooke

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