Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

The Quantum Hall Effect in Spin Quartets in Graphene KESHAV SHRIVASTAVA, University of Malaya — Using the non-relativistic Schroedinger equation, we find that for (1/2)g=(1/2)±s gives zero charge for negative sign and one charge for positive sign. This explains the conductivity at i = 0 and 1. For s=3/2, (1/2)g=2 for positive sign and hence g=4. The substitution in the series, -(5/2)(gμ_BH), -(3/2)(gμ_BH), -(1/2)(gμ_BH), +(1/2)(gμ_BH),+(3/2)(gμ_BH), +(5/2)(gμ_BH), ..., etc., g=4 gives, -10, -6, -2, +2, +6, +10, etc. This series is the same as observed in the experimental data of quantum Hall effect in graphene. When we take n=2 in the flux quantization, i.e., 2(hc/e), we generate the plateaus at ±4. Thus the plateaus can occur at 0, 1, 4 and at 2, 6, 10, 14, ..., etc. Thus the quantum Hall effect in graphene is understood by means of non-relativistic theory. The fractions such as 1/3 or integers such as 0,1,4,..., 2,6,10,14, ... multiply the charge and hence describe the "effective charge" of the quasiparticles. This means that there is "spin-charge locking".

1. K. N. Shrivastava, Phys. Lett. A 113, 435(1986); 115, 436(E)(1986); Phys. Lett. A, 326, 469(2004); AIP Conf. Proc. 909, 43(2007);909,50(2007.

2. Z.Jiang, et al, Phys. Rev. Lett. 98,197403(2007);Y.Zhang et al, Phys. Rev. Lett. 96, 136806(2006).

Keshav Shrivastava
University of Malaya

Date submitted: 11 Nov 2007 Electronic form version 1.4