2/15/2016

Corrections

1 Page 44

Footnote was updated as follows:
The contents of this chapter are based on the articles: Hongki Min and A. H. MacDonald, *Chiral decomposition in the electronic structure of graphene multilayers*, Phys. Rev. B **77**, 155416 (2008); Hongki Min and A. H. MacDonald, *Electronic structure of multilayer graphene*, Prog. Theor. Phys. Suppl. **176**, 227 (2008).

2 Page 62

In Eq. (4.32), the low-energy spectrum can be obtained from the effective Hamiltonian in Eq. (4.19) not in Eq. (4.17).

3 Page 73

Eq.(4.51) should be

$$\left|\beta^{-}_{N+1}\right\rangle = \frac{1}{\sqrt{2}}\left(\left|\beta_{N+1}\right\rangle - \left|\beta_{N-1}\right\rangle\right),$$

Eq.(4.52) should be

$$\left|\Phi_{\sigma_{N-1}}\right\rangle = \frac{1}{2}\left|\beta_{N-1}\right\rangle + \frac{\sigma_{N-1}}{\sqrt{2}}\left|\alpha_{N}\right\rangle + \frac{1}{2}\left|\beta_{N+1}\right\rangle,$$

Eq.(4.53) should be

$$\left\langle\alpha_{N+1}|H|\beta^{-}_{N+1}\right\rangle = -\frac{t_{\perp}}{\sqrt{2}}\nu\dagger,$$

4 Page 96

Footnote was updated as follows:
The contents of this chapter are based on the article: Hongki Min, Rafi Bistritzer, Jung-Jung Su, and A. H. MacDonald, *Room-temperature superfluidity in graphene bilayers*, Phys. Rev. B **78**, 121401(R) (2008).

5 Page 107

Section 6.5. Discussion was rewritten.

6 Page 115

The Hamiltonian matrix elements should be $t_{\mu,\mu'}(\boldsymbol{\delta}) = \langle \phi_{\boldsymbol{R}_b,\mu} | \, H \, | \phi_{\boldsymbol{R}_{b'}+\boldsymbol{\delta},\mu'} \rangle$.

7 Page 123

For the exchange-correlation potential in LDA, $v_x(\boldsymbol{x}) = -e^2 \left(\frac{3}{\pi} n(\boldsymbol{x})\right)^{\frac{1}{3}}$ is only for the exchange part while the correlation part $v_c(\boldsymbol{x})$ can be obtained by fitting to numerical correlation energy for the homogeneous gas.

8 Page 135

In Eq. (D.1), there should be a constant term a_0 in the Hamiltonian:

$$H = a_0 + \boldsymbol{a} \cdot \boldsymbol{\tau} \tag{1}$$

9 Page 136

The second equation of Eq.(D.6) should be

$$G_t^R(\epsilon) = \frac{1}{2} \left(\frac{1}{\epsilon - \epsilon_+ + i\eta} - \frac{1}{\epsilon - \epsilon_- + i\eta} \right).$$

In addition, $(\boldsymbol{a} \cdot \boldsymbol{\tau})(\boldsymbol{b} \cdot \boldsymbol{\tau}) = \boldsymbol{a} \cdot \boldsymbol{b} + i(\boldsymbol{a} \times \boldsymbol{b}) \cdot \boldsymbol{\tau}$ and the equivalent expression of the Green's function were added for reference.

10 Page 137

References for the anomalous Hall conductivity and the spin Hall conductivity were added. Equations for the Chern numbers were corrected.

11 Appendix A

Derivation of the effective theory of graphene near the K/K' points was added. Indices in the Block and Wannier functions were corrected.

12 References

The following reference was added:
Ref.[4] A. H. Castro Neto, F. Guinea, N. M. R. Peres, K. S. Novoselov, and A. K. Geim. Rev. Mod. Phys., 81:109, 2009.

The following references were updated:
Ref.[50] Y. Barlas and R. Cote and K. Nomura and A. H. MacDonald. *Phys. Rev. Lett.*, 101:097601, 2008.
Ref.[68] J.-J. Su and A. H. MacDonald. *Nat. Phys.*, 4:799, 2008.