Errata for
Berry Phases in Electronic Structure Theory: Electric Polarization, Orbital Magnetization and Topological Insulators
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p. viii: On line 25, “topics topics” should be replaced by “topics”.

p. 49: Below Eq. (2.45), “any one-particle operator $O$” should be replaced by “any cell-periodic one-particle operator $O$”.

p. 86: Exercise 3.2 should read as follows:

**Exercise 3.2** In Sec. 3.1.1 we constructed the parallel-transport gauge of Eq. (3.9) for the system described by Eq. (3.2). Show that Eq. (3.2) corresponds to a twisted parallel-transport gauge. There are two other choices for a twisted parallel-transport gauge starting from the same $|\bar{u}_a\rangle$. What are they?

p. 86: In Ex. 3.4, “under the cyclic series of distortions shown there” should be replaced by “under the continuous cycle passing through the stages shown there”. In (a), “mesh of $\varphi$ values and save them in an array” should be replaced by “mesh of $\varphi$ values, and increase the mesh density until you obtain a converged result”.

p. 95: On the left-hand side of the last line of (3.43), $t_{23}$ should be $t_{20}$.

p. 97: On the left-hand side of the last line of (3.44), $t_{23}$ should be $t_{20}$.

p. 102: In Ex. 3.10(d), $d\mathbf{d}/dt$ should be $d\langle \mathbf{d}\rangle/dt$.

p. 111: In Ex. 3.11, subscripts $k$ should be $k$ since we are in 1D.

p. 111: In Ex. 3.14(b), `chain_alt_bp` should be `chain_alt_bp.py`.

p. 127: In Eq. (3.112), the factor $e^{-ik\mathbf{R}}$ should be removed.

pp. 131-2: Three lines above Eq. (3.123), “new states $|\tilde{u}_{nk}\rangle$” should be “new states $|\tilde{u}_{nk}'\rangle$”; Eq. (3.123) should read $|\tilde{u}_{nk}'\rangle = \sum_m V_{mn} |\tilde{u}_{mk}\rangle$; the ket on the right-hand side of Eq. (3.124) should be $|\tilde{u}_{nk}'\rangle$; and the $|\tilde{u}_{nk}\rangle$ in the first line on p. 132 should be $|\tilde{u}_{nk}\rangle$.

p. 149: In Eq. (4.25), the factor of $i$ should be deleted from the second line.

p. 151: In Eq. (4.29), the group velocity vector should be $\mathbf{v}_k$ (i.e., in bold font).
p. 158: 4.2(b) should be replaced by
Show that \( \langle u_{nk}|v_{k}|u'_{nk}\rangle = \langle u_{nk}|p|u'_{nk}\rangle/m \) for different bands \( n \neq n' \).

p. 161: In Eq. (4.51), \( d^3k \) should be replaced by \( d^3\kappa \).

p. 172: In Ex. 4.8, the displayed equation at the bottom of the page should be
\[ p_j = -\frac{e}{2\pi} \tilde{\phi}^{(\kappa_j)}, \]
and the last text line of the problem on p. 173 should read “as \( p_j = (e/2\pi) \text{Im} \ln \det M \), where”.

p. 181, Ex. 4.9, the problem should have been posed in the context of the electronic polarization only (i.e., without the ionic contribution).

p. 190: In Eq. (4.93), the sin and cos should be interchanged so that it reads
\[ \delta = \delta_0 \sin \lambda, \]
\[ \Delta = \Delta_0 \cos \lambda, \]
and the last line of the caption should read:
\[ (d) \nu_1 = 1, \nu_1' = 0, \nu_2 = 1, \nu_2' = 0. \]
\[ (e) \nu_1 = 0, \nu_1' = 1, \nu_2 = 0, \nu_2' = 1. \]
\[ (f) \nu_1 = 0, \nu_1' = 1, \nu_2 = 1, \nu_2' = 0. \]

p. 219: In the 5th line of the 2nd paragraph, \( \rho_{xx} \) should be \( \sigma_{xx} \).

p. 222: In the 8th line of the 2nd paragraph, “It fact” should be “In fact”.

p. 224: In Exercise 5.4 part (c), last sentence, “in part (c?)” should be “in part (b)?”.

p. 230: On 3rd line from the bottom, “imagin e” should be “imagine”.

p. 246: In the caption of Fig. 5.17, primed and unprimed indices were interchanged. Thus, the last part of the caption should read:
\[ (d) \nu_1 = 1, \nu_1' = 0, \nu_2 = 1, \nu_2' = 0. \]
\[ (e) \nu_1 = 0, \nu_1' = 1, \nu_2 = 0, \nu_2' = 1. \]
\[ (f) \nu_1 = 0, \nu_1' = 1, \nu_2 = 1, \nu_2' = 0. \]

p. 252: In Ex. 5.12, “Fig. 5.15(e-g)” should be “Fig. 5.15(e-h)”.

p. 254: Six lines below Eq. (5.29), \( \sqrt{f_1^2 + f_2^2 + f_3^2} \) should be \( \sqrt{f_1^2 + f_2^2 + f_3^2} \).

p. 260: The sign of \( \chi \) is reversed in several of the lines below Eq. (5.36): in the 4th and 11th lines, \( -\chi \) should be \( \chi \); and in the 12th line, \( \chi = C_a - C_b \) should be \( \chi = C_b - C_a \). (Here Chern indices are defined with respect to the outward normal, unlike in Eq. (5.34).)

p. 267: Ex. 5.20 should have asked to “show that the AHC is \( \sigma_{AHC} = -e^2k_0/hc \)”.

p. 282: In Eqs. (6.16-17), the “Im” should be moved inside the integral for the purposes of Ex. 6.2 on p. 285.

p. 283: In Eq. (6.22), \( M_{\text{DOS}} \) should be \( M_{\text{DOS}} \).

p. 293: Eq. (6.32) was missing a factor of \( \mathcal{E}_\nu \); it should read
\[ |u_{nk}\rangle = (1 + i\hbar e_\nu T_{nk}^2 v_{k,\nu}) |u_{nk}^0\rangle \]

p. 295: In Eq. (6.42), \(-e\) should be \(-e^2\) in the numerator just after the equal sign.

p. 296: In Eq. (6.46), \(\tilde{A}\) should be \(\tilde{A}_\mu\).

p. 328: On the 8th line from the bottom, matlib should be MATLAB.

To the reader: If you discover additional errors, please report them via email to dhv@physics.rutgers.edu.